

Strategies and Challenges for Managing Human Influenza in the Iranian Hospitals: A Qualitative Study in Yazd Province, central part of Iran

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ARTICLE INFO

Original Article

Received: 10 May 2022

Accepted: 10 April 2022



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ABSTRACT

Introduction: Influenza virus is one of the deadliest viruses that has threatened the human population over the years. Every year, organizations and hospitals must be prepared to deal with the disease and treat people with the flu and be able to manage the disease in the hospital. The aim of this study was to identify hospital management strategies for human influenza in Yazd province, central part of Iran.

Methods: This study was a qualitative study with inductive conventional approach. A total of 14 main hospitals in Yazd province were surveyed in 2021. The study population included heads and managers of hospitals, nurses, educational and clinical supervisors, metrons, officials of the quality improvement office and the infection Control Committee. Participants were selected using snowball sampling method. Semi structured interviews were used to collect data. The sample size in this study was up to information saturation. Content analysis method was used to analyze the data.

Results: Using the opinions and views of 38 managers and officials of selected hospitals in Yazd province, data saturation was obtained. The most important tasks of the hospital management in terms of influenza control and management were divided into 5 areas (field measures, support, training, awareness, protection and measures in the field of human resources). The major challenges regarding the influenza control and management were classified into 3 areas: hospital (health), macro (university, provincial, national and Ministry of Health guidelines) and community level. Finally, the most important solutions and suggestions were categorized in these 3 key areas.

Conclusion: Based on the categorized challenges and problems, as well as the classification of the most important strategies and suggestions, useful action can be taken to the control and management of influenza, both at the hospital level and in the community, in Iranian hospitals especially in Yazd province.

Keywords: Hospital Management, Influenza, Yazd Province

How to cite this paper:

Bahariniya S, Shafii M, Madadizadeh F, Sharif Yazdi M. Strategies and challenges for managing human Influenza in the Iranian hospitals: A Qualitative Study in Yazd province. J Community Health Research 2022; 11(2): 126-136.

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Introduction

The flu virus is one of the deadliest viruses that has threatened the human population over the years. The prevalence and prevalence of influenza virus is a factor in its survival and one of the most important reasons for the death of this virus (1-3). Influenza has different frequencies and intensities between different groups and even has a higher mortality rate in some groups with underlying diseases. Health professionals usually diagnose the flu based on its symptoms. Rarely, they detect the flu virus by testing blood or nasal or throat fluid samples. The flu is accompanied by fever, cough, chills with chills, bruising and pain, headache and fatigue. These symptoms usually last for 3 to 4 days. Influenza is a distinct viral disease with its own specific symptoms and usually occurs in late autumn and winter (4). Failure to accurately and timely identify the cause of the disease in people with the flu and the use of inappropriate antibiotics can lead to death (5, 6). Every year, as the weather cools, flu outbreaks are reported across the country and in different parts of the world. Influenza is an acute and deadly disease with the potential for widespread epidemics. In order to reduce the social and economic costs of this disease, vaccination against it is very effective in the whole population and endangered populations (7-9).

It seems that increasing the level of public awareness of this disease and placing more emphasis on the power of transmission and contagion, in addition to improving public awareness and perceived severity of this disease, also helps to improve preventive behaviors (8, 10, 11).

According to the statistics published by the Vice Chancellor for Health of ShahidSadoughi University of Medical Sciences in Yazd, the number of definite positive cases of influenza in 2017 was two and in 1397, it was four, which has increased to 60 in 1398. Also this year, 960 people suspected of having this disease were identified in the province, of which 406 people were hospitalized in the province, and the majority of these people were elderly. The point that is very important is that every year all organizations and

hospitals must be prepared to deal with this disease and treat people with the flu and be able to manage this disease in the hospital and therefore the hospital. Do not face problems such as lack of beds, lack of manpower, dangerous outbreaks of influenza in the hospital environment and other problems(12).

In a similar study, Mehdipour et al(2018) investigated the factors related to hospitalization in patients with H1N1 influenza at Afzalipour Hospital in Kerman and concluded that the disease and background factors play a major role in the exacerbation of the disease. Therefore, the health system should take the necessary preventive measures during an epidemic. In this study, it is pointed out the need to pay attention to preventive measures in order to have an effective solution (13).

This study aimed to identify the Strategies and the challenges for managing human Influenza in the Iranian hospitals, especially in Yazd province, central part of Iran.

Methods

This qualitative study was conducted by content analysis method with inductive contractual approach. Lack of sufficient information about hospital management of influenza led to the use of inductive contractual approach in the present study; By referring to the experiences of people, we gradually categorized, summarized information and obtained the main concepts. In the first step, the scattered data were examined, then we obtained the implicit concepts and finally the abstract levels. Achieving abstract levels was the end of the data analysis phase.

A total of 14 main hospitals in Yazd province were surveyed. The selected hospitals of Yazd province were: "ShahidSadoughi", "ShahidRahnemoun", "Afshar", "Kargar Martyrs", "Seyed Al-Shohada", "ShahidBeheshti Taft", "Fatemeh Al-Zahra Mehriz", "Imam JafarSadeghMeybod", "ZiaeiArdakan", "ValiasrBafgh", "Ayatollah Khatami Khatam", "Khatam Al-AnbiaAbarkooh", "Mortaz" and

"Mojibian".

The study population included heads and managers of hospitals, nurses, educational and clinical supervisors, metrons, officials of the Quality Improvement Office and the Infection Control Committee. Participants were selected using snowball sampling method. semi-structured interviews were used to collect data. The focus of the interview questions was the position and importance of the hospital management position in controlling the flu and the challenges facing the hospital management.

These challenges were expressed in 5 basic themes, which are: structure and organization, laws and instructions, resources and facilities, weakness of explanatory and educational courses on influenza to the people, and macro and upstream policies. The sample size as well as qualitative studies was done until there were no new information (saturation).

Content analysis method was also used to analyze the study data. Among the most important criteria for inclusion in the study were having knowledge and experience in the field of hospital management, good communication skills and having time for interviews. Also, people who did not have the time or inclination to be interviewed and participate in the study were excluded from the study. It should be noted that at the beginning of

the interview, the purpose of the research, the interview method and the right of individuals to participate in the study or to refuse it were explained to the participants by the researcher. They were told about the recording of the interviews and the confidentiality of the information, and then their informed consent was obtained.

The research project was approved by the Research Council of Shahid Sadoughi University of Medical Sciences in Yazd and was in the form of a research grant from the university.

Ethics Code

IR.SSU.REC.1399.037

Results

Data saturation was obtained by using the opinions and views of 38 managers and officials of selected hospitals in Yazd province, which was done purposefully and then with the method of snowball.

The interview guide questions in the present study included the interviewees' experiences in important areas such as the tasks of the hospital management, challenges and problems, solutions and suggestions and opinions regarding the national and provincial communication guidelines (possible weaknesses) (**Table 1**).

Table 1. Interview guide questions

Interview questions	
1	Tell us about your experience as a hospital manager or supervisor in controlling and managing the flu? Do you have practical and effective experience in this field?
2	In your experience, what are the most important challenges and problems in controlling and managing the flu?
3	Do you have valuable experience with influenza control and management strategies?
4	Given your valuable experiences; What are the shortcomings and problems of the national and provincial communication instructions? Is it possible to add or subtract items to the notification instructions?

The most important tasks of the hospital management regarding influenza control and management were divided into 5 areas (field

measures, support measures, training and awareness measures, protection measures and measures in the field of human resources) (**Table 2**).

Table 2. The most important tasks of the hospital management in terms of control and management of human influenza

Scattered data (codes)	Implicit concepts	Abstract levels
• Activate hospital committees • Implement the approvals of the hospital management and leadership committee • Establish efficient regulatory mechanisms • Establish coordination between different departments of the hospital • Implement health instructions and protocols • Develop effective operational plans • Consensus of hospital management team members • Exchange of information between senior managers of the hospital • Active and physical presence of management in crisis situations • Regular visits to hospital wards • Establish discipline in the hospital • Delegate appropriate authority in the hospital • Proper service in the field of treatment • Providing standard services in terms of quality and quantity • Review treatment processes • Follow up on defects and possible problems • Effective internal and external communications and interactions • Prepare to control the disease	Field actions	Duties of hospital management
• Providing hospital infrastructure • Providing facilities and equipment required for the hospital • Providing standard personal protective equipment • Provide proper ventilation for the hospital • Establishment of special wards for hospitalization of patients • Considering support spaces for patients • Providing standard spaces for the hospital • Providing standard disinfectants • Standardization of respiratory isolation rooms • Providing the required pharmaceutical items	Support actions	Duties of hospital management
• Training of hospital staff and staff • Informing staff about the instructions • Awareness of personnel about the nature of infectious diseases, transmission chains and ways to control these types of diseases • Planning for patient and patient education (distribution of pamphlets and educational brochures in the clinic, installation of educational banners and posters and face-to-face training)	Educational and awareness-raising activities	
• Care and protection of hospital staff • Control of admission of patients to the hospital • Separation of flu patients from other patients • Establish restrictions in the hospital environment	Protective measures	
• Provide adequate and alternative manpower • Management, arrangement and relocation of manpower • Support and encourage the management of the hospital • Motivate hospital staff • Creating sensitivity in personnel in order to provide better services • Obligation to observe health tips by hospital staff	Human resource actions	

The most important challenges and problems regarding influenza control and management were classified into 3 areas: hospital (health), macro

(university, provincial, national and Ministry of Health guidelines) and community level (Table 3).

Table 3. The most important challenges and problems regarding influenza control and management

Scattered data (codes)	Implicit concepts	Abstract levels
- Lack of human resources - Lack of infectious disease specialists - Misalignment of hospital staff - Intensive shifts of hospital staff - Reluctance of staff to participate in training courses - Lack of motivation and positive points to staff - Internal fear of hospital staff - Excessive expectations of hospital staff - Low knowledge and health literacy of staff	Issues related to the field of manpower	
- Lack of medicinal items - Lack of health equipment and facilities - Vaccine shortages and limitations - Lack of personal protective equipment - Lack of efficient and standard disinfectants - Lack of flu diagnostic tests - Lack of beds for ICU wards - Low quality of personal protective equipment	Issues related to hospital facilities and equipment	Challenges of the hospital area (healthcare)
- Lack of a dedicated ward for patients - Lack of standard respiratory isolation rooms - Problem in separating the physical spaces of the hospital - Existence of non-standard physical spaces in the hospital - Lack of space in hospital wards - Problems in providing proper ventilation	Issues related to support and infrastructure	
- Criticism of the hospital management - Lack of hospital management authority over influenza control - Lack of effective monitoring of patients' treatment process - Lack of proper management of available resources - Lack of budget and financial resources	Issues related to the field of management	
- Lack of a single command to manage the crisis - The focus of the management cycle is on treatment rather than prevention		
- Focus on non-communicable diseases - Lack of separate funding for infectious diseases - Lack of knowledge and lack of awareness of health policy makers	Issues related to the country (at the level of the Ministry of Health)	
- Lack of effective and efficient macro policies - Failure to include community needs in educational curricula		Challenges of the macro area
- Invasion of immigrants and non-natives in Yazd province - Lack of participation of scientific executive officials of all regions in decision making		
- Negligence and unpreparedness of senior provincial managers - Existence of conflict of interest and parallel work between different provincial agencies - Lack of effective cross-sectoral interactions - Lack of serious determination and inefficient planning	Provincial issues (at the provincial level)	

Scattered data (codes)	Implicit concepts	Abstract levels
- No referral or crisis hospital in the province - The dependence of Yazd hospitals on immigrants - Lack of support for private hospitals - Crisis management charts do not work - Irregularities in law enforcement - Lack of documentation and recording of experiences - Lack of evidence-based knowledge management structure - Do not anticipate potential costs	Issues related to the academic field	
- Non-functional and non-operational formulation - Lack of executive guarantee - Instructions are not updated - Inadequacy of available financial resources - Lack of localization in compilation - Late notification of instructions - Contradictory instructions - Lack of trust in internal instructions - Multiple instructions - Issuing instructions from various institutions - Inaccuracy in compilation and haste - Long instructions	Issues related to the instructions issued by the Ministry of Health	
- Low culture and health literacy of the community - Non-observance of health and prevention tips - Disease normalization for people - Unnecessary referrals to hospitals - Lack of self-care by people - Non-observance of the incubation period of the disease by the people	Issues related to community culture	
People do not trust the vaccine		Community level challenges
- Low quality of training courses - Non-standard training courses - Transmitting trivial training to the public - Lack of timely education and information to the people - Lack of community-based training	Issues related to education	
Inability of people to receive services due to high costs of medicine and treatment	Issues related to economics	
The most important strategies and suggestions regarding influenza control and management were classified into 3 areas: hospital (health), macro	(university, provincial, national and instructions issued by the Ministry of Health) and community level (Table 4).	

Table 4. The most important solutions and suggestions regarding influenza control and management

Scattered data (codes)	Implicit concepts	Abstract levels
• Provide training to hospital staff • Empowerment of hospital staff • Encourage and reward hospital staff • Providing the necessary human resources • Proper management and arrangement of human resources • Off personnel with defective immune systems • Vaccination of all hospital staff • Select a person with authority to take charge of infection control	Solutions related to the field of human resources	
• Consider the stock space in the hospital • Depot of pharmaceutical items and facilities • Entrepreneurship of hospitals in the production of protective equipment	Solutions related to hospital facilities and equipment	
• Standardization of respiratory isolation rooms • Isolation of influenza patients from others	Solutions related to the field of support and infrastructure	Solutions related to the hospital field (health)
• Scientific authority and supervision over the treatment process of patients • Attract financial support from endowments and donors • Obtain insurance support • Establishment of charitable associations for public aid • Existence of participatory management in the hospital • Planning to improve the quality of education • Supervising the proper implementation of training courses • Prioritize treatment for High Risk patients • Involvement of hospitals in the prevention debate	Solutions related to the field of management	
• Provide training to policy makers and senior managers • Review of health structure and organization • Activate health care networks • Develop macro and forward-looking policies • Do not ignore infectious diseases • Modify and create organizational positions to hire specialists • Create new planning with a new approach • Involve experts in decision making • Highlighting infectious disease education among medical students • Creating a crisis chart taking into account strengths and weaknesses (roadmap)	Solutions related to the country (at the level of the Ministry of Health)	
• Screening and educating immigrants and non-natives • Interaction of provincial committees with the field of health • Establish organizational discipline • Establish civil laws and regulations • Proper implementation of the rules and regulations • Establish and strengthen cross-sectoral communication • Establish short-term quarantines • Sharing the experiences of managers	Solutions related to the provincial area (at the provincial level)	Macro area solutions
• Establishment of a crisis hospital in Yazd province • Evaluate the performance of hospitals in Yazd province • Evaluation of facilities and equipment of hospitals in Yazd province • Allocate sufficient budget for hospitals in Yazd province • Assist policymakers to fund hospitals • Increasing patient admission capacity in hospitals in Yazd province	Solutions related to the academic field	

Scattered data (codes)	Implicit concepts	Abstract levels
- Review university policies to further address private and city hospitals - Not all hospitals are involved in infectious diseases - Fair distribution of resources among the province's hospitals - Create comprehensive, native, and applicable instructions - Review, modify and update existing instructions - Writing instructions based on hospital experiences - Establish regulatory mechanisms - Hospitals return to the university to improve the shortcomings - Educating, informing and informing the people - Take action to promote health and prevention - Changing people's beliefs and attitudes - Creating sensitivity in people - Tracking the movement of sick people in the community by appropriate applications - Improving the quality of mass media education - More specialized training provided to people - Use the capacity of cyberspace for training - Installation of educational banners and advertising billboards - Synergy of training provided to the public with staff training - Distribution of cheap vaccines in the community - Distribution of personal protective equipment in abundance and low prices in the community	Solutions related to the instructions issued by the Ministry of Health Solutions related to community culture Solutions related to education Economic solutions	Community level solutions

Discussion

The influenza virus has about sixteen serotypes, six of which have caused disease in humans (H1, H2, H3, H5, H7 and H9). It is said that one of the three types H1, H2 and H3 has been identified as the etiological cause of the recent influenza epidemic. This virus is transmitted from person to person through respiratory secretions. The power of this virus in changing surface antigens is the most important factor that can cause new epidemics in human societies every year. Therefore, it is known as the sixth cause of death among humans (12).

The aim of this study was to investigate hospital management strategies for influenza in Yazd province. In the present study, the opinions and views of 38 managers and officials of selected hospitals in Yazd province were purposefully extracted and then by snowball method. According to the results, one of the major challenges, both at the macro level, such as the pillars of the Ministry of Health and Medical Education, and at the community and general public level, is the lack of health knowledge and literacy. Lack of awareness,

lack of knowledge and lack of health literacy among health professionals, professionals, policymakers and the general public has led to the spread of infectious diseases such as the flu and can lead to irreparable damage. It seems that it is better to take effective measures to increase the health knowledge and literacy of senior managers, health system policy makers and specialists first. Then health knowledge should be injected into the heart of society as a culture. According to the results of Yildirim (2020) study, although vaccine can be an effective drug to fight infectious diseases such as influenza, but effective interventions must be taken to greatly reduce the incidence of the disease. Effective education and prevention can greatly reduce the use of health services and thus reduce costs and contribute to the health economy (14). The results of this study show the need to pay attention to health, prevention and education, which is consistent with the results of the present study.

Another major challenge addressed in this study is the shortage and limitation of vaccine distribution. Lack of vaccine or even late

distribution of vaccine can have dangerous and irreversible consequences for both the medical staff and the general public. Relevant authorities should take the necessary measures to prepare and distribute the vaccine fairly before the outbreak of autumn and the outbreak of influenza. In the first place, the necessary measures should be taken for the fair distribution of vaccines and vaccinations of medical staff in hospitals. The Deputy Minister of Health of the Ministry of Health and the Deputy Ministers of Health of the relevant universities must have a well-written and efficient plan for the fair distribution of the vaccine in a timely manner. Therefore, it seems that the main priority in the first place is to vaccinate the treatment staff before the onset of the cold season. Late distribution may not lead to potential effects or reduce problems. A similar study was conducted by Lai in 2020 and placed special emphasis on the need to vaccinate medical staff to prevent influenza (15), the results of which are in line with the results of the present study.

The next issue is the vaccination of high-risk groups at the community level. Obviously, the whole community can't be fully vaccinated. Therefore, precise mechanisms must be developed to vaccinate high-risk and sensitive groups in society (16). A study in 2019 by Costantino found that distrust, fear of adverse reactions, and not being considered a high-risk group for influenza were the main reasons for not getting the flu vaccine. Counts (17). Although health and prevention are a key element, in the next phase of influenza vaccination is a key factor in preventing economic losses such as absenteeism and indirect costs. It seems that health system policymakers should develop comprehensive and detailed guidelines for vaccinating high-risk groups in society and instill confidence in the vaccine in the spirit of society.

Another major challenge and issue that Yazd province is grappling with is the influx of immigrants and non-natives (especially from the south of the country). Due to the fact that Yazd province has committed, compassionate and experienced doctors, many people in other cities

tend to receive services from Yazd hospitals and doctors. It is also necessary to mention that Yazd province has international expertise in many fields and has become the center of medical tourism in the country. Yazd province is a tourist-friendly province and it is obvious that tourists lead to the spread of more and more diseases in Yazd city. However, preventing them from entering the city of Yazd also causes many problems. Preventing patients and tourists from entering the charter calls into question patient rights and prevents better and more patient access. Therefore, it is necessary for senior managers and policy makers of the health system to use useful monitoring mechanisms to prevent the spread of flu and conflict in Yazd despite the entry of patients from other cities to Yazd province and the lack of economic damage to public hospitals. One of the measures that can be done is screening patients before entering Yazd province.

Other major challenges include poor documentation and experience recording, as well as a lack of evidence-based knowledge management structure (18). With a knowledge management database, remote treatment staff will be able to operate (protect themselves from illness) and thereby experience a great patient care experience (19). A physician can also share and disseminate new knowledge gained while working in the field. The physician can also access the decision-making process and the scenarios drawn, so that he or she is aware of the type of actions and how to deal with specific cases when they occur. The World Health Organization maintains up-to-date knowledge and shares key findings among governments, health organizations, and the public as well as awareness of symptoms, treatment, and measures to prevent further outbreaks. Despite the ability to share digital knowledge, the general public, as well as health care professionals and government agencies, can obtain the information they need through these databases and, after analysis and review, take the necessary steps. Sharing knowledge about the flu focuses on prevention; Today's world is in dire need of better knowledge management, as a tool to create an alert

and response system for the spread of diseases such as the flu. Knowledge management saves lives with the ability to share the most accurate and up-to-date global knowledge about health information (3).

Lack of standard isolated isolation rooms and lack of proper ventilation systems are among the most important challenges and problems of the support department of hospitals in Yazd province (20, 21). It seems that these issues should be carefully considered and followed at the beginning of the construction of a hospital. If all the necessary standards are observed at the beginning of the construction of a hospital, further problems will be avoided and additional costs will not be borne by the hospitals. The Ministry of Health, Treatment and Medical Education, as the main trustee of public health, should issue strict and standard instructions to build highly efficient respiratory isolation rooms and ventilation systems, and to allocate suitable spaces in hospitals for this purpose (22).

It seems that paying attention to the hospital field (health), macro field (university, provincial and national), community level and the field of communication instructions and implementation of the proposed solutions can significantly reduce the challenges and problems. And control and manage the flu well and reduce the damage and subsequent problems.

One of the important operational limitations of the present study was the prevalence of Covid-19 disease. Due to the conflict between hospitals and senior managers, there was a delay in conducting the present study and conducting interviews. Also, due to the acute conditions of the hospitals, a number of interviews were conducted in absentia (telephone and cyberspace). Lack of similar previous studies is another limitation in the discussion of the present study.

References

Uncategorized References

1. Hadi-Alijanvand H. From Folding Pathway of Hemagglutinin to Influenza Prevalence in Iran, A Computational Approach. Cellular and Molecular Researches (Iranian Journal of Biology). 2020;33(4):598-612.

Conclusion

Based on the challenges and problems categorized in the present study, as well as the classification of the most important strategies and suggestions, useful measures can be taken to the control and management of influenza, both at the hospital and in the community level.

It should be noted that the basic principle and important point is to pay attention to healthcare education, providing guidelines for prevention and treatment. All relevant university, provincial and national institutions should pay special attention to health and prevention in order to reduce the huge costs in the field of treatment and thus not to impose a heavy financial burden on patients. Paying attention to the field of hospital (health), macro (university, provincial and national), community level and the field of communication instructions and implementation of the proposed solutions can significantly reduce the challenges and problems.

Conflicts of interest

All authors declare to have no conflict of interest.

Author contribution

The authors all were involved in the whole article but specifically, S.B. Was involved with interviewing and Discussion part, F.M., and M.S. were involved with coding and theme analysis and writing the Results section. M.S.Y. was involved with literature review, references, and writing the introduction part of the article.

Acknowledgment

We would like to thank all our participants who kindly gave their worthy time even though they were under great pressure. Also, this research was approved as a research project with code 7108 by the Research Council of ShahidSadoughi University of Medical Sciences, Yazd.

2. Organization WH. Managing epidemics: key facts about major deadly diseases: World Health Organization; 2018.
3. Shu Y, McCauley J. GISAID: Global initiative on sharing all influenza data—from vision to reality. *Eurosurveillance*. 2017;22(13):30494.
4. Mousavi T, Nadi A, Moosazadeh M, Haghshenas M. Estimating co-morbidity of H1N1 pandemic and other diseases: a meta-analysis of countries in eastern mediterranean region. *Journal of Mazandaran University of Medical Sciences*. 2017;27(154):189-211.
5. Marty A, Greiner O, Day PJ, Gunziger S, Mühlemann K, Nadal D. Detection of *Haemophilus influenzae* type b by real-time PCR. *Journal of clinical microbiology*. 2004;42(8):3813-5.
6. Hassan-King M, Baldeh I, Adegbola R, Omosigbo C, Usen S, Oparaugo A, et al. Detection of *Haemophilus influenzae* and *Streptococcus pneumoniae* DNA in blood culture by a single PCR assay. *Journal of Clinical Microbiology*. 1996;34(8):2030-2.
7. Rahmanian V, Shakeri M, Shakeri H, Jahromi SA, Bahonar A, Madani A. Epidemiology of influenza in patients with acute lower respiratory tract infection in South of Iran (2015-2016). *Acta facultatis medicae Naissensis*. 2019;36(1):27-37.
8. Tavanaee-Sani A, Sharifi R, Nehbandani Z, Masoudi M-H, Solouki Y. Epidemiology and Clinical Outcomes of Patients with Confirmed Influenza in Mashhad, Iran in 2019. *International Journal of Infection*. 2021;8(4).
9. GP DH. Mortality due to the 2009 pandemic influenza A (H1N1) in Markazi Province of Iran. *Mortality*. 2012;14(59):66-72.
10. Costantino C, Amodio E, Calamusa G, Vitale F, Mazzucco W. Could university training and a proactive attitude of coworkers be associated with influenza vaccination compliance? A multicentre survey among Italian medical residents. *BMC medical education*. 2016;16(1):1-6.
11. Cowman K, Mittal J, Weston G, Harris E, Shapiro L, Schlair S, et al. Understanding drivers of influenza-like illness presenteeism within training programs: a survey of trainees and their program directors. *American Journal of Infection Control*. 2019;47(8):895-901.
12. Jafari M, Zainali F, Modjallal Najar F. What We Learned from the 2019 Influenza Crisis. *Journal of Disaster and Emergency Research*. 2020;3(2):64-6.
13. Mehdipour S, Zolala F, Hoseinnejad M, Zahedi R, Najafi E, Farrokhnia M, et al. Factors associated with hospitalization in patients with H1N1 influenza in Afzalipour Hospital, Kerman, Iran, 2015: a case-control study. *Iranian Journal of Epidemiology*. 2018;14(2).
14. Yildirim M, Griffin P, Keskinocak P, O'Connor JC, Swann JL. Estimating the impact of self-management education, influenza vaccines, nebulizers, and spacers on health utilization and expenditures for Medicaid-enrolled children with asthma. *Journal of Asthma*. 2021;58(12):1637-47.
15. Lai E, Tan HY, Kunasekaran M, Chughtai AA, Trent M, Poulos C, et al. Influenza vaccine coverage and predictors of vaccination among aged care workers in Sydney Australia. *Vaccine*. 2020;38(8):1968-74.
16. Sridhar S, Brokstad KA, Cox RJ. Influenza vaccination strategies: comparing inactivated and live attenuated influenza vaccines. *Vaccines*. 2015;3(2):373-89.
17. Costantino C, Casuccio A, Caracci F, Bono S, Calamusa G, Ventura G, et al. Impact of communicative and informative strategies on influenza vaccination adherence and absenteeism from work of health care professionals working at the university hospital of Palermo, Italy: a quasi-experimental field trial on twelve influenza seasons. *Vaccines*. 2019;8(1):5.
18. Nguyen L, Bellucci E, Nguyen LT. Electronic health records implementation: an evaluation of information system impact and contingency factors. *International journal of medical informatics*. 2014;83(11):779-96.
19. Chevance A, Gourion D, Hoertel N, Llorca P-M, Thomas P, Bocher R, et al. Ensuring mental health care during the SARS-CoV-2 epidemic in France: A narrative review. *L'encephale*. 2020;46(3):193-201.
20. Babaoglu UT, Miletli Sezgin F, Yag F. Sick building symptoms among hospital workers associated with indoor air quality and personal factors. *Indoor and Built Environment*. 2020;29(5):645-55.
21. Asadi L, Tabatabaei RS, Safinejad H, Mohammadi M. New corona virus (COVID-19) management in pregnancy and childbirth. *Arch Clin Infect Dis*. 2020;15(COVID-19):e102938.
22. Morawska L, Tang JW, Bahnfleth W, Bluyssen PM, Boerstra A, Buonanno G, et al. How can airborne transmission of COVID-19 indoors be minimised? *Environment international*. 2020;142:105832.