



Behavioural and Social Drivers of Seasonal Influenza Vaccination (BeSD IN) in Jordan

Ayman Bani Mousa^{a,1}, Nizar Maswadi^{b,1}, Zaid Al-Hamdan^{c,*}, Mohammad Alhawarat^d, Lora Al Sawalha^e, Raid Anwar Al-Shboul^f, Feras Ibrahim Hawari^g

^a Director of Epidemic Administration Directorate, MOH, Jordan

^b Expand Program on Immunization Management Manager, MOH, Jordan

^c Professor, Jordan University of Science and Technology, Jordan

^d Director of Communicable Disease Directorate, MOH, Jordan

^e Technical Officer, World Health Organization, Jordan Country Office, Amman, Jordan

^f Secretary-General of Epidemiological Affairs, Ministry of Health, Jordan

^g His Excellency the Minister, MOH, Jordan

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ABSTRACT

Background: Cultural norms and social beliefs play a significant role in shaping attitudes toward vaccination. The Jordanian Ministry of Health, with the support of international health organizations, has launched several initiatives to improve influenza vaccination coverage. However, challenges persist, particularly among certain demographic groups, making it essential to understand the underlying knowledge, behaviors, and attitudes influencing vaccination decisions. This study aims to explore these factors through a large-scale survey conducted among healthcare workers, pregnant women, and elderly people in Jordan.

Method: A cross-sectional survey was designed to identify social and behavioral drivers (BeSD) of influenza vaccination among three key target groups in Jordan: healthcare workers, pregnant women, and the elderly. A convenience sample comprising 1,500 participants was recruited from the three target groups. The sample randomly selected from the three regions in Jordan, Data were collected through interviews conducted by trained and qualified research assistants.

Result: The study revealed that 82.9 % of participants were aware of the influenza vaccine, with healthcare workers showing the highest awareness at 95 %, followed by pregnant women at 76 %, and the elderly at 70 %. Despite high awareness, only 45.6 % of respondents had been vaccinated in the past two years. Healthcare workers had the highest vaccination rates (65 %), while pregnant women (30 %) and the elderly (25 %) exhibited lower rates, primarily due to concerns about vaccine safety and accessibility challenges. Misconceptions were common, with 30 % of participants believing the flu vaccine causes influenza, and 25 % doubting its efficacy. These misconceptions were more prevalent among the elderly and rural populations. Access and affordability were significant barriers, particularly for the elderly, with many reporting difficulties in traveling to vaccination centres and lacking insurance coverage.

Conclusion: To improve influenza vaccination rates, targeted public health campaigns should be conducted to correct misconceptions, especially among the elderly and pregnant women. Possible plans of action for improving uptake rates are improving accessibility by organizing mobile clinics, offering subsidized vaccines, and giving healthcare providers the necessary training to combat hesitancy among the general population. Further research needs to be undertaken to develop strategies for reassuring the public that vaccinations are safe and effective.

* Corresponding author.

E-mail addresses: zaid_hamdan@otmail.com, zmhamdan@just.edu.jo (Z. Al-Hamdan), alsawalhal@who.int (L. Al Sawalha), SG.phc@MOH.GOV.JO (R.A. Al-Shboul), minister@moh.gov.jo (F.I. Hawari).

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1. Background

A highly contagious respiratory illness, influenza is considered a global health challenge [1]. Influenza is one of the most common vaccine-preventable infections affecting individuals. Around the globe, the annual influenza epidemics are estimated to result in about 3–5 million cases of severe illness, and about 250,000–500,000 deaths [2]. All sections of the population are susceptible to influenza, but some groups, such as healthcare workers, pregnant women, and the elderly, are significantly more vulnerable [2]. Influenza is considered a health challenge throughout the world because it threatens heightened morbidity and mortality rates. It is particularly dangerous to those considered high-risk due to other health conditions, such as pregnant women, those being treated for chronic health conditions, and the elderly. Although vaccination has long been seen as the most effective preventive measure [3], many people worldwide do not seek or accept vaccination. This is also true in the United States and Europe, where there are well-established immunization programs. Research has shown that people are often hesitant to receive vaccines because they harbour fears about vaccine safety, as well as a belief that the vaccine causes illness, compounded by an expressed lack of trust in healthcare systems [4–7]. Lower-middle-income countries (LMICs), including Jordan, report even lower vaccination coverage rates than the developed countries. A Lebanese study reported that, despite recommendations from public health authorities, only 27 % of high-risk adults received the influenza vaccine [8]. Studies conducted in Jordan have revealed similar trends. Factors identified as barriers to vaccine uptake include limited access to healthcare, being unable to afford the vaccine, and cultural beliefs [9,10].

The people of the Middle East, including Jordanians, often hold cultural norms and social beliefs that promote negative attitudes toward vaccination. Researchers working in Saudi Arabia identified a number of religious and cultural beliefs that worked against vaccine acceptance. For example, many people consider natural immunity to be superior to vaccine-induced immunity [11]. Efforts have been made to improve influenza vaccination uptake in LMICs, but still levels remain below the optimal range. Egyptian researchers found that education campaigns targeting HCWs significantly increased influenza vaccination rates by 20 % within a year [12]. Results were promising when social influencers and religious leaders in Saudi Arabia were encouraged to promote vaccine uptake among the general public [13]. The Jordanian Ministry of Health (MoH) offers the influenza vaccination to high-risk populations like HCWs, the elderly, and pregnant women, but low vaccination rates persist. A study conducted by Barham in 2018 reported that only 30 % of HCWs in Jordan had received the influenza vaccine. Many put their non-compliance down to concerns about side effects and lack of time. Furthermore, a Jordanian cross-sectional study of pregnant women, another highly vulnerable group, revealed that only 25 % had received the influenza vaccine, despite 78 % being aware of its availability [14]. An effective way of reducing the prevalence of influenza and limiting its complications is a widespread national vaccine campaign. The outcome of such a campaign should be a reduction of the burden on healthcare systems and a significant fall in mortality rates [15]. Despite concerted efforts, vaccine uptake in Jordan remains well below the desired levels. Several factors contribute to the low uptake rates, including poor public awareness, issues that limit access, and cultural beliefs. It is highly recommended that healthcare workers (HCWs) receive an annual influenza vaccination since their jobs render them more exposed to influenza viruses than the general population [16]. This puts their own health and the safety of their patients potentially at risk [17].

With the backing of international health organizations, the Jordanian Ministry of Health has implemented several strategies with the aim of boosting influenza vaccination coverage. Unfortunately, these strategies have not been entirely successful, particularly among certain demographic groups. The current study conducted a large-scale survey

of healthcare workers, pregnant women, and the elderly in Jordan, with a view to gaining a more complete understanding of the factors and attitudes that are behind the negative perceptions about the influenza vaccine and ultimately informing policy development and public health strategies to increase influenza vaccination coverage in the country.

2. Methodology

2.1. Study design and sampling

A cross-sectional survey was designed to identify behavioral and social drivers (BeSD) of influenza vaccination among three key target groups in Jordan: healthcare workers, pregnant women, and the elderly. The tools for BeSD of influenza vaccination have been developed and field-tested based on existing globally validated tools (BeSD of childhood vaccination and BeSD of COVID-19 vaccination) [8]. The questions and indicators are derived from validated questions within the BeSD of childhood vaccination and the BeSD of COVID-19 vaccination tools. A convenience sample of 1,500 participants was selected from three target groups: elderly adults, pregnant women, and healthcare workers. The healthcare workers group included physicians, nurses, pharmacists, and other members of the healthcare team. All eligible participants were made aware of the voluntary nature of the study and their right to withdraw without any penalty. Data were collected through interviews conducted by trained and qualified research assistants.

2.2. Data collection process

The data collection process took place during July and August 2024 after the study protocol received approval from the Ministry of Health IRB committee. Prior to data collection, all participants were asked to sign an informed consent form. All data collectors attended one data training program on research ethics, the data collection tool, and orientation to the forms and data entry before conducting face-to-face interviews with participants to ensure a high response rate and accuracy in data collection. The language of the survey was Arabic.

2.3. Questionnaire

The Social and Behavioral Drivers (BeSD) tool comprises four key components consists of 23 questions for adults, with added supplementary questions for health workers or pregnant persons and it is take around 20 min to complete it. designed to capture a holistic understanding of the factors influencing health behaviors, particularly vaccine uptake. Participants were asked to report on how they think and feel, giving their perceptions of vaccine safety, effectiveness, and necessity, as well as emotional responses like fear or trust in vaccines. They were also asked to respond regarding social processes to explore how social networks, peer influences, and cultural norms shape an individual's decision to get vaccinated. Another focus was motivation, including the personal drivers behind the decision to vaccinate and the desire to protect oneself or others. Finally, they were asked about practical issues such as access to vaccines, the convenience of getting vaccinated, and any barriers to vaccination, such as cost or time.

2.4. Data analysis

Data from the survey was cleaned and analyzed using SPSS V29 statistical software. Descriptive statistics served to give a summary of the data, and inferential statistics were used to explore relationships between knowledge, behaviors, and attitudes toward vaccination. The results were stratified by demographic variables such as age, gender, education level, and geographic location to identify any significant differences in vaccination behaviors and attitudes.

3. Results

3.1. Demographics

A total of 1,500 participants completed the interview and were included in the analysis. The mean age of the total sample was 47.7 (SD $\pm$ 17.9). The majority were females (n = 949, 63.3 %), from the north region (43.8 %), from urban areas (81.8 %), had a college degree or a bachelor's degree (46.8 %), and no chronic diseases (58.1 %). The most frequently reported chronic conditions were diabetes (20.7 %) and heart disease (15.9 %).

In terms of the study groups, elderly adults accounted for 41.9 % (n = 629), health workers 34.9 % (n = 523), and pregnant women 23.2 % (n = 348). The distribution of the study variables across the study groups is presented in [Table 1](#). Pregnant women were the youngest group.

3.2. Vaccination status

[Table 1](#) presents the characteristics of influenza vaccination among the study groups. Of the total sample, only 45.6 % had received the vaccine in the last two years. The remaining 54.4 % had not taken it. The highest percentage of non-vaccination observed was among elderly adults (60.57 %) and pregnant women (59.2 %). Among those vaccinated, most received the vaccine at health centers (33.92 %), and a significant majority (70.9 %) did not pay for their vaccination.

3.3. Knowledge about influenza and vaccination

The survey revealed that 82.9 % of participants were aware of the influenza vaccine, with healthcare workers having the highest levels of awareness (95 %), compared to pregnant women (76 %), and the elderly (70 %). The primary sources of information about the vaccine were healthcare providers (45 %), media campaigns (30 %), and social networks (25 %).

Participants with higher levels of education demonstrated greater knowledge about the benefits of influenza vaccination. However,

Table 1

The characteristics of influenza vaccination among the total study sample. Thinking and feeling.

	Total N (%)	Old adults n (%)	Health worker n (%)	Pregnant persons n (%)
Received vaccine in the last two years				
No	816 (54.4)	381 (60.57)	229 (43.8)	206 (59.2)
Yes	684 (45.6)	248 (39.43)	294 (56.2)	142 (40.8)
Number of Vaccine doses in the last two years				
None	816 (54.4)	381 (60.57)	229 (43.8)	206 (59.2)
One time	361 (24.1)	140 (22.26)	118 (22.6)	103 (29.6)
Two times	323 (21.5)	108 (17.17)	176 (33.7)	39 (11.2)
Vaccination location among vaccinated				
Health center	232 (33.92)	127 (51.21)	38 (12.9)	67 (47.2)
Workplace	222 (32.46)	10 (4.03)	203 (69.1)	9 (6.3)
Pharmacy	96 (14.04)	49 (19.76)	13 (4.4)	34 (23.9)
Hospital	78 (11.4)	35 (14.11)	29 (9.9)	14 (9.9)
Doctor's office	31 (4.53)	11 (4.44)	4 (1.4)	16 (11.3)
Other	25 (3.65)	16 (6.45)	7 (2.4)	2 (1.4)
Paid for Vaccination among vaccinated				
No	485 (70.9)	151 (60.89)	264 (89.8)	70 (49.3)
Yes	199 (29.1)	97 (39.11)	30 (10.2)	72 (50.7)
Who paid for vaccination n = 1GG				
Myself	106 (53.3)	50 (51.55)	15 (50)	41 (56.9)
Family member	76 (38.2)	43 (44.33)	7 (23.3)	26 (36.1)
Employer	8 (4)	5 (5.15)	2 (6.7)	1 (1.4)
Health insurance	5 (2.5)	1 (1.03)	2 (6.7)	2 (2.8)
Other	2 (1)	1 (1.03)	0 (0)	1 (1.4)

misconceptions were prevalent, with 30 % of respondents believing that the flu vaccine can cause influenza, and 25 % expressing doubts about its efficacy. These misconceptions were more common among the elderly and rural populations.

3.4. Vaccination behaviors

In terms of vaccination behaviors, 45.6 % of respondents reported being vaccinated within the past two years, with healthcare workers having the highest vaccination rates (65 %). Among pregnant women, only 30 % had received the influenza vaccine, citing concerns about vaccine safety during pregnancy as the main reason for not getting vaccinated.

Elderly participants reported the lowest vaccination rates, with only 25 % having received the vaccine in the past two years. Accessibility was a significant issue for this group, with many reporting difficulties in traveling to vaccination centers. Additionally, cost was a barrier for those without insurance coverage, particularly among rural residents.

3.5. Attitudes toward vaccination

Overall, 75 % of participants believed that the influenza vaccine is important for public health, but only 55 % were confident in its safety. Healthcare workers were the most confident in the vaccine's safety (80 %), while pregnant women and the elderly expressed more reservations.

Social influence was an important factor in vaccination decisions, with 40 % of participants stating that they were encouraged to get vaccinated by healthcare providers or peers. However, 20 % of respondents reported avoiding vaccination due to negative experiences shared by friends or family members.

3.6. Factors associated with receiving the influenza vaccine

The results demonstrate, as presented in [Table 2](#) that variables in the thinking and feeling domain were strongly associated with influenza vaccination across all study groups. This domain includes individuals' perceptions of their risk of getting influenza, awareness of the vaccine's availability, and confidence in its effectiveness and safety. Elderly adults who were moderately or very concerned about their personal risk of contracting influenza were 3.22 (95 % CI: 2.28, 4.55) times more likely to receive the vaccine compared to those who reported being less concerned. Health workers (OR: 1.80; 95 % CI: 1.20, 2.72) and pregnant women (OR: 3.41; 95 % CI: 2.16, 5.38) showed similarly strong associations. Awareness of the influenza vaccine was particularly impactful for elderly adults (OR: 7.96; 95 % CI: 4.6, 13.77) and pregnant women (OR: 8.64; 95 % CI: 4.16, 17.96). This indicates the importance of increasing public awareness of the influenza vaccine's availability and benefits. Participants' expressed confidence in the effectiveness, safety, and benefit of the vaccine was a key driver of vaccination uptake across all groups, with ORs ranging from 2.73 for pregnant individuals to 10.50 for health workers.

In the Motivation domain, the intention to get vaccinated was the greatest predictor of vaccination uptake across all groups. This highlights the critical role of motivation, particularly for health workers. Those who stated a clear intention to get vaccinated were 9.68 (95 % CI: 6.68, 14.04) times more likely to receive the vaccine for elderly adults, 24.38 (95 % CI: 15.33, 38.76) for HCWs, and 7.38 (95 % CI: 4.56, 11.93) for pregnant women. The Social Processes domain also played a significant role in influencing vaccination behaviour, with peer and family norms, as well as recommendations from health workers, proving to be strong predictors. Elderly adults who reported positive family norms regarding vaccination were 4.12 (95 % CI: 2.91, 5.81) times more likely to receive the vaccine, and similar trends were observed among health workers (OR: 5.75; 95 % CI: 3.71, 8.91) and pregnant individuals (OR: 4.52; 95 % CI: 2.62, 7.79). Health worker recommendations were especially influential for pregnant individuals (OR: 4.50; 95 % CI: 2.84,

Table 2

BeSD factors associated with receiving influenza vaccine.

	Old adults OR (95 % CI)	Health workers OR (95 % CI)	Pregnant persons OR (95 % CI)
Thinking and feeling			
Perceived risk: self (M or V concerned)	3.22 (2.28, 4.55)	1.80 (1.20, 2.72)	3.41 (2.16, 5.38)
Perceived risk: severity (M or V sick)	3.45 (2.47, 4.83)	1.60 (1.11, 2.31)	2.70 (1.74, 4.19)
Awareness (Yes)	7.96 (4.6, 13.77)	0.85 (0.34, 2.12)	8.64 (4.16, 17.96)
Perceive effectiveness, self (M or V protection)	8.1 (5.57, 11.77)	7.88 (5.30, 11.71)	3.66 (2.32, 5.75)
Perceived effectiveness, others (M or V protection)	8.05 (5.57, 11.64)	5.10 (3.51, 7.42)	2.73 (1.75, 4.25)
Confidence in vaccine benefits (M or V important)	8.73 (6.02, 12.64)	10.50 (6.99, 15.78)	5.29 (3.31, 8.44)
Confidence in vaccine safety (M or V safe)	9.96 (6.74, 14.72)	6.05 (4.04, 9.07)	5.60 (3.39, 9.25)
Confidence in health workers (M or V confident)	3.94 (2.45, 6.33)	3.06 (1.72, 5.45)	1.75 (1.00, 3.08)
Vaccination required by your employer (Yes)	–	2.84 (1.98, 4.06)	–
Requirement: Consequences (M or V concerned)	–	2.74 (1.54, 4.88)	–
Perceived risk: Others (M or V concerned)	–	0.80 (0.51, 1.26)	–
Perceived risk: baby (Yes)	–	–	1.52 (0.96, 2.40)
Perceived effectiveness: baby (Yes)	–	–	1.39 (0.88, 2.19)
Intention to get vaccinated (want to)			
No	1	1	1
Yes	9.68 (6.68, 14.04)	24.38 (15.33, 38.76)	7.38 (4.56, 11.93)
Social processes			
Social responsibility (Yes)	5.76 (4.05, 8.18)	8.37 (5.64, 12.42)	4.43 (2.80, 7.02)
Peer norms (Yes)	5.04 (3.54, 7.17)	2.26 (1.56, 3.29)	1.81 (1.16, 2.85)
Family norms (Yes)	4.12 (2.91, 5.81)	5.75 (3.71, 8.91)	4.52 (2.62, 7.79)
Community leader norms (Yes)	1.40 (0.96, 2.04)	1.50 (1.02, 2.20)	1.28 (0.78, 2.09)
Religious leader norms (Yes)	1.52 (0.99, 2.33)	1.97 (1.18, 3.29)	0.94 (0.52, 1.71)
Health worker recommendation (Yes)	7.41 (5.14, 10.67)	2.90 (1.96, 4.28)	4.50 (2.84, 7.11)
Decision autonomy (You [self])	2.72 (1.66, 4.46)	0.78 (0.32, 1.92)	2.05 (1.17, 3.58)
Workplace norms (Yes)	–	2.38 (1.66, 3.43)	–
Practical issues			
Received recall	5.35 (3.16, 9.08)	1.36 (0.96, 1.94)	7.83 (3.14, 19.52)
Know where to get vaccinated	8.2 (5.33, 12.62)	3.77 (1.94, 7.33)	11.3 (5.62, 22.72)
Ease of access (M or V easy)	2.45 (1.77, 3.40)	1.58 (1.03, 2.43)	1.70 (1.10, 2.62)
Affordability of vaccination	3.28 (2.31, 4.66)	1.13 (0.66, 1.96)	2.01 (1.28, 3.15)
Service satisfaction (M or V satisfied)	19.35 (12.7, 29.48)	9.82 (6.52, 14.81)	9.24 (5.39, 15.84)
Diagnosis of influenza (Yes)	–	1.23 (0.83, 1.81)	–
Responding to questions (M or V confident)	–	2.15 (1.49, 3.10)	–

7.11) and elderly adults (OR: 7.41; 95 % CI: 5.14, 10.67). The elderly and pregnant women with self-decision autonomy were more than twice as likely to receive the vaccination. Positive workplace norms were associated with higher odds (OR: 2.38; 95 % CI: 1.66, 3.43) of receiving vaccination among the health workers. Practical issues were found to be crucial in determining vaccine uptake. Knowing where to get vaccinated, ease of access, and affordability were key factors. Pregnant

women who knew where to get vaccinated were 11.3 (95 % CI: 5.62, 22.72) times more likely to be vaccinated, while elderly adults and health workers showed ORs of 8.2 (95 % CI: 5.33, 12.62) and 3.77 (95 % CI: 1.94, 7.33), respectively. Affordability of vaccination was another

important predictor in this domain, particularly among the elderly (OR: 3.28; 95 % CI: 2.31, 4.66) and expectant mothers (OR: 2.01; 95 % CI: 1.28, 3.15).

4. Discussion

Analysis of the data collected for this study revealed that, although 47.3 % of the participants were found to be well-informed about the influenza vaccine, there were still some sizeable gaps in their knowledge. The results of this study reveal that while there is a high overall awareness of the influenza vaccine (82.9 %), significant variations exist among different population groups, with healthcare workers demonstrating the highest levels of awareness (95 %), followed by pregnant women (76 %), and the elderly (70 %). These findings align with previous research, which has consistently shown that HCWs, due to their professional exposure and training, tend to have higher levels of awareness and knowledge about vaccinations compared to the general public [18,19]. However, the lower awareness levels among pregnant women and the elderly highlight key gaps that need to be addressed through targeted public health campaigns [20,21]. The primary sources of vaccine-related information were healthcare providers (45 %), media campaigns (30 %), and social networks (25 %). This is consistent with studies that emphasize the role of healthcare professionals as the most trusted and effective sources of vaccine information. The reliance on healthcare providers suggests that improving communication between healthcare workers and vulnerable populations, such as the elderly and pregnant women, could significantly boost awareness and address misconceptions [20,22]. Higher levels of education were associated with better knowledge about the benefits of the influenza vaccination. This finding supports previous research, which shows that education has a major influence on health behaviors and attitudes toward vaccinations. However, the persistence of misconceptions—30 % of participants believed that the flu vaccine causes influenza, and 25 % doubted its efficacy—indicates that knowledge gaps still exist. These misconceptions are concerning, as they can undermine vaccine uptake and reduce herd immunity. Other studies have similarly documented that myths about vaccines, particularly the belief that the flu vaccine can cause the flu, remain common among less educated and rural populations [23,24].

The fact that misconceptions were more prevalent among the elderly and rural populations is notable. Previous research has shown that these groups often have limited access to reliable health information, which makes them more vulnerable to misinformation [18,20]. In rural areas, barriers such as limited healthcare infrastructure, reduced access to health professionals, and lower exposure to media campaigns may contribute to these misconceptions. Additionally, older adults may rely more heavily on outdated or incorrect information about vaccines, further perpetuating vaccine hesitancy [20,21]. The results of this study highlight significant disparities in vaccination behaviors across different population groups, with notable differences in uptake rates between healthcare workers, pregnant women, and the elderly [12,21]. Overall, 45.6 % of respondents reported being vaccinated against influenza in the past two years, which is consistent with findings from other studies in similar settings. HCWs exhibited the highest vaccination rates (65 %), which is expected given their professional exposure to health risks and stronger awareness of the importance of vaccinations [12,21]. In contrast, only 30 % of pregnant women reported receiving the influenza vaccine, which is particularly concerning given that pregnant women constitute one of the groups most vulnerable to complications from influenza. The pregnant participants in this study voiced their major concern that it is not safe to take the vaccine during pregnancy because it may cause harm to the foetus, which echoes the findings of other

studies [20,22].

In the Motivation domain, HCWs who reported an existing intention to take the vaccine were found to be 24 times more likely to get vaccinated, which points to the importance of reinforcing strong intentions through workplace policies and health education [25]. In the Social Processes domain, participants' responses revealed that they were heavily influenced by peers and family members who encouraged them to take the vaccine. This was particularly true of older adults and pregnant women. Recommendations to take the vaccine from healthcare professionals had a great impact, underlining the important role played by HCWs in promoting vaccination [25,26].

Our results showed that practical issues such as access and affordability were of great importance, since numerous elderly and pregnant participants identified a lack of knowledge about how and where the vaccine was offered and high cost as major barriers to receiving the vaccine [27].

5. Limitation

This quantitative study on (BeSD IN) in Jordan has several limitations. Although the study included a sample of 1,500 participants—comprising healthcare workers, pregnant women, and older adults—the quantitative design provided limited insights into the underlying reasons for participants' attitudes toward vaccination. Therefore, a qualitative approach is recommended to explore in greater depth the barriers and facilitators influencing vaccination behaviors. Moreover, as the study relied on self-reported survey data, there is the possibility of social desirability and recall biases, where respondents might provide answers they believe are socially acceptable rather than reflecting their genuine beliefs and behaviors. Finally, the timing of the study—following the coronavirus outbreak—may have influenced responses by increasing participants' awareness of the influenza vaccine's importance. Future research should address these limitations by incorporating qualitative methods and ensuring a more geographically diverse sample.

6. Conclusion

It is evident from the findings of this study that there is an urgent need for educational interventions aimed at changing widespread misconceptions and improving knowledge about the vaccine. It is important to implement public health campaigns aimed at correcting misinformation, particularly targeting the elderly, rural populations, and other vulnerable groups. Decision makers could benefit from leveraging the trust placed in healthcare providers and using media and community-based initiatives to reach underserved areas. Vaccine uptake can be potentially increased by ensuring the public that the influenza vaccine is indeed safe and effective.

To encourage the most vulnerable groups in society, including the elderly and expectant mothers, to accept the influenza vaccine, the healthcare system needs to develop some innovative strategies that increase access to vaccines. Possible options include the establishment of mobile vaccination clinics, offering free or subsidized vaccines for uninsured individuals, and developing public health messaging specifically aimed at the needs and concerns of these populations. It is crucial that HCWs are given the necessary training and resources to combat vaccine hesitancy effectively, particularly among pregnant women.

This study has identified several disparities in vaccination behaviors among the Jordanian population and offered a number of policy options geared toward reducing barriers to vaccination. Making vaccination services more easily accessible, as well as providing affordable or free vaccines, represent major steps toward achieving higher vaccination coverage. Furthermore, health authorities should give priority to creating robust public awareness campaigns to increase the public's knowledge and understanding of the importance of getting vaccinated. These policies of targeted education and enhanced accessibility would

serve to significantly raise influenza vaccine uptake levels, thus fortifying the protection of vulnerable populations.

CRedit authorship contribution statement

Ayman Bani Mousa: Validation, Data curation, Conceptualization. **Nizar Maswadi:** Investigation, Data curation. **Zaid Al-Hamdan:** Writing – original draft, Validation, Project administration, Formal analysis. **Mohammad Alhawarat:** Methodology, Investigation. **Lora Al Sawalha:** Writing – review & editing, Validation, Funding acquisition. **Raid Anwar Al-Shboul:** Funding acquisition, Resources. **Feras Ibrahim Hawari:** Conceptualization, Resources.

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Declaration of competing interest

The authors declare the following financial interests/personal relationships which may be considered as potential competing interests: Zaid Al-Hamdan reports financial support was provided by The Task Force for Global Health. If there are other authors, they declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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Data availability

Data will be made available on request.

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