The Efficacy of Targeted Educational Intervention in Increasing Influenza and COVID-19 Vaccine Uptake

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ABSTRACT

Vaccine hesitancy, defined as the delayed acceptance or refusal of available vaccination, is a threat to public health. It increases the spread of communicable disease through the reduction of vaccine uptake. Therefore, it is imperative to develop public health strategies which effectively decrease vaccine hesitancy. In order to reduce hesitancy and increase uptake, educational interventions are commonly used to educate the vaccine-hesitant population about vaccine safety. Many current educational interventions are generalised educational interventions, meaning they provide
individuals with generic vaccine information that may not address their specific concerns. In contrast, targeted educational interventions allow individuals to indicate their reasons for remaining hesitant about vaccination and have them directly addressed. This paper argues that targeted educational intervention should be further emphasised in public health strategies for reducing COVID-19 and influenza vaccine hesitancy. Reasons for COVID-19 and influenza vaccine hesitancy are extremely diverse and dependent on the individual and their healthcare history. Targeted interventions are more effective in the addressal of these diverse and specific concerns. This paper reviews external literature regarding the efficacy of targeted educational intervention in reducing both influenza and COVID-19 vaccine hesitancy. The results indicate that generalised educational interventions alone are often insufficient to reduce vaccine hesitancy, while targeted educational interventions are effective at both reducing vaccine hesitancy and increasing vaccine uptake. Thus, the results of this systematic literature review support the notion that vaccination campaigns should emphasise targeted interventions as a key component of their strategy.

**SCIENCE ⇒ POLICY**

This paper argues that educational interventions which aim to decrease influenza and COVID-19 vaccine hesitancy should directly address the concerns indicated by the individual receiving the intervention. The article shows how vaccine hesitancy threatens public health and how vaccine uptake greatly increases when the specific concerns of vaccine hesitant individuals are addressed and dispelled by said targeted interventions. Vaccination campaigns are a critical component of public health policy, and the implications of the reviewed studies indicate that public health organizations should further emphasise targeted educational interventions in their strategies for decreasing influenza and COVID-19 vaccine hesitancy.

**Key Words**

vaccination, education, healthcare, hesitancy

**Introduction**

Vaccination is an important preventative measure which decreases the spread of communicable disease. Childhood vaccination is currently estimated to save 4 million lives every year worldwide [1]. In addition to reducing mortality against diseases which are still prevalent today, vaccination is responsible for the successful eradication of smallpox, which is estimated to save 5 million lives globally each year [2]. Even beyond mortality, vaccination has massively reduced morbidity from both diseases it has been responsible for eradicating and illnesses which it attenuates [3]. Thus, vaccines are one of history’s most critical discoveries when it comes to improving public health outcomes. Unfortunately, despite the checks in place to ensure the safety and efficacy of vaccines which are available to the public, vaccine hesitancy is widespread. Vaccine hesitancy is defined by the SAGE Working Group on Vaccine Hesitancy as refusing or delaying acceptance of vaccination [4]. It is a major threat to public health because it reduces vaccine uptake, promoting the spread of communicable disease. Vaccine hesitancy is an extremely multifaceted issue, stemming from diverse sources that may differ based on one’s culture and socioeconomic status. Concerns about vaccines may be derived from personal fears and mistrust which are specific to each individual and their history with the healthcare system [5]. Still, a number of the most prominent reasons for vaccine hesitancy have been identified in past studies. These include safety concerns, desire for more information from health professionals, religious beliefs, and institutional mistrust [6].
A key strategy that has been used to reduce vaccine hesitancy and potentially increase uptake is educational intervention. Educational interventions are the methods by which information regarding vaccination safety, necessity, and myths is disseminated. This paper makes a distinction between general educational interventions and targeted educational interventions. General educational intervention involves providing individuals with generic information about the vaccine that may not address their specific concerns, such as an informational poster that is placed in a public space. Conversely, targeted educational interventions allow hesitant individuals to indicate specific concerns about vaccination and have them directly addressed. This targeted educational intervention could take many forms, such as question and answer sessions with healthcare professionals or specific letters and pamphlets distributed to individuals which address their reasons for not receiving the vaccine. Many current public health strategies rely on general educational interventions to increase vaccine uptake. However, since different people have different concerns about vaccination, ensuring that educational interventions address the specific concerns of each individual is crucial. This paper argues that targeted educational interventions should be further integrated into current public health strategies for increasing vaccine uptake, specifically for influenza and COVID-19.

**Increasing Influenza Vaccine Uptake**

Influenza virus is a communicable virus that can cause hospitalisation and death. In the 2015-2016 flu season, the vaccine prevented over 5 million infections and 3,000 deaths in the United States [7]. Common sources of influenza vaccine hesitancy include the following: safety concerns, the belief that the flu is not dangerous enough to warrant vaccination, and the belief that the vaccine is ineffective [8]. Concerns surrounding the influenza vaccine are diverse, and generalised educational interventions alone are often insufficient to reduce vaccine hesitancy [9,16,17]. However, numerous studies have found that targeted educational intervention is much more effective at increasing influenza vaccine uptake [9,10,13]. For instance, face-to-face conversations and phone calls with nurses were found to be much more effective at reducing influenza vaccine hesitancy than traditional generalised flu campaigns [10]. These traditional campaigns do not tend to involve interactive and targeted components that address individuals’ specific concerns. One-on-one targeted interventions appear to be especially effective at increasing influenza vaccine uptake, especially among high-risk groups. One such intervention involving a one-on-one question and answer session for pregnant women increased influenza vaccine uptake by 11% compared to a control group without the intervention [11]. The efficacy of one-on-one targeted intervention was also seen in immunocompromised patients, where an influenza vaccine question and answer session increased vaccine uptake by 62.5% compared to the control group without the intervention [12]. Targeted interventions in the form of individualised conversations with healthcare professionals allow patients to have their concerns addressed by reputable individuals, increasing their likelihood of receiving the vaccine.

The aforementioned targeted educational interventions involved direct interaction with healthcare professionals. Organising direct interpersonal interactions between healthcare professionals and hesitant individuals can be labour intensive, but it is not always necessary for effective targeted educational interventions. Targeted educational interventions such as messages or personalised letters designed to address recipients’ concerns also increase influenza vaccine uptake. These targeted letters are more effective than educational interventions that involve generic posters [13]. Thus, this form of targeted educational intervention is still more effective than generalised educational intervention, despite the lack of direct interpersonal interaction. Using personalised letters and messages to increase vaccine uptake is a very useful potential strategy because it is easy to tailor the letters.
to target the concerns of the recipients. For instance, pregnant women who are hesitant to receive vaccines could be sent letters detailing how the influenza vaccine will not harm their child, and individuals in medically underrepresented racial groups could be sent letters explaining that the vaccine has shown success among members of their racial group. Targeted educational interventions addressing the concerns of these specific groups have been effective at increasing influenza vaccine uptake [7]. The distribution of personalised educational letters to Aboriginal families in Australia increased influenza vaccine uptake among Aboriginal children by 34% compared to the group with no intervention [14]. Thus, targeted educational intervention in the form of letters addressing specific concerns indicated by the individual can increase vaccine uptake.

While targeted educational interventions have been found to be more effective than generalised educational interventions in increasing influenza vaccine uptake, general educational interventions can still play a role in public health strategies for increasing vaccine uptake. Targeted educational intervention can be coupled with generalised educational intervention to reduce influenza vaccine hesitancy. In a group of elderly patients in outpatient clinics in Hong Kong, an intervention was tested involving both a 3 minute one-on-one conversation with medical students about the influenza vaccine and a general pamphlet regarding influenza vaccination. The intervention significantly increased influenza vaccine uptake compared to the group that received no intervention, with vaccine uptake in the intervention group being 8.6% higher than in the control group [15]. The one-on-one conversation was the targeted component of the intervention, and it allowed participants to have their specific concerns addressed. This was complemented by the pamphlet, which provided general information that participants could refer back to in the future. Thus, targeted intervention complements general educational intervention well and the two can be used together to effectively reduce influenza vaccine hesitancy. With that said, it should be emphasised that generalised educational intervention in the absence of a targeted component is often insufficient to reduce vaccine hesitancy [13]. Across a sample of over 1680 patients in France the impact of educational pamphlets and posters on influenza vaccine uptake was examined. This common generalised educational intervention was found to have no significant impact on increasing uptake in comparison to a control group which did not have posters and pamphlets presented to them [16]. An examination of generalised text messages concerning the safety of the influenza vaccine in pregnant women in Canada yielded similar results. In comparison to a control group that received no reminder or educational text messages, the experimental group that received general reinforcement for the influenza vaccine showed no significant increase in uptake [17]. Such results concerning generalised educational interventions in isolation indicate that the targeted component is indeed necessary to increase vaccine uptake.

**Increasing COVID-19 Vaccine Uptake**

The COVID-19 vaccine is no exception to vaccine scepticism. The COVID-19 pandemic has overwhelmed global healthcare systems, causing over 6.5 million deaths worldwide [18]. The upheaval caused by the pandemic has led to heightened emotional responses concerning the vaccine. This makes individuals more receptive to popular conspiracy theories and elicits traditional concerns regarding general vaccination side effects [19]. In addition to evoking traditional vaccination concerns, the COVID-19 vaccine also generates hesitancy because it is the first mRNA vaccine used in humans, and many are unsure if they can trust the new technology [20]. During the height of the pandemic, an overwhelming amount of conflicting information about the COVID-19 vaccines in the media caused confusion and increased vaccine hesitancy [21]. Much like influenza, the largest concerns that increase COVID-19 vaccine hesitancy have been identified, and include lack of
institutional trust, the vaccine’s seemingly impossible speed of development, and negative side effects [22]. Since these concerns increase COVID-19 vaccine hesitancy, they also decrease COVID-19 vaccine uptake. Increasing COVID-19 vaccine uptake is necessary for controlling the spread of the disease and reducing serious illness and death [23]. As of December 2022, the COVID-19 vaccine prevented over 3 million deaths and 18 million hospitalizations in the United States alone [24]. Since reducing vaccine hesitancy is a necessary precursor to increasing vaccine uptake, efforts must be taken to increase trust in the vaccine.

The ability to have specific concerns addressed in an educational intervention is especially important for the COVID-19 vaccine. The heightened emotions surrounding the pandemic have produced a wider variety of reasons for distrusting the vaccine. While there is less literature on the efficacy of educational intervention in increasing COVID-19 vaccine uptake than there is for the influenza vaccine, targeted educational intervention has effectively increased COVID-19 vaccine uptake in specific populations. For instance, an educational intervention that coupled a PowerPoint addressing common COVID-19 vaccine myths with a question-and-answer session with healthcare providers significantly reduced COVID-19 vaccine hesitancy in an American military base population. The study found that 36% of the participants who were initially hesitant about receiving the vaccine became receptive to it after the intervention [25]. This intervention combined general intervention with a targeted question-and-answer component which allowed participants to have their specific vaccination concerns addressed, reinforcing the aforementioned effectiveness of a combined general and targeted strategy. Although the study did not determine whether the reduced vaccine hesitancy translated to increased vaccine uptake, reducing vaccine hesitancy is a necessary precursor to increasing vaccine uptake. Thus, the results show that targeted educational intervention can be a useful strategy to further emphasise in public health campaigns to increase COVID-19 vaccine uptake.

There is evidence that targeted educational intervention not only decreases COVID-19 vaccine hesitancy, but also increases vaccine uptake. In an elderly population in Singapore, a targeted educational intervention involving a phone call with healthcare professionals resulted in a 12% increase in vaccine uptake [26]. This targeted educational intervention allowed participants to tailor the phone call to their specific concerns regarding the vaccine and have them assuaged. Targeted educational interventions involving question and answer sessions with medical professionals also increased vaccine uptake among Genesis HealthCare nursing home staff in the United States. The targeted interventions implemented by Genesis HealthCare specifically placed an emphasis on addressing vaccine concerns related to diversity and inclusion, increasing vaccine uptake among ethnic minorities. They found that the targeted intervention increased vaccine uptake by 8.2% among American Indian and Alaskan Native participants, 6.1% among Hispanic participants, and 5.4% among African American participants [27]. The fact that these methods effectively increased vaccine uptake exemplifies the importance of targeted educational intervention. It is also critical to note that the success of this targeted intervention was displayed in regard to the COVID-19 vaccine, a much newer vaccine in comparison to the influenza vaccine. This suggests that targeted educational intervention can be an effective means of increasing vaccine uptake for various different vaccination programmes.

Conclusion

Vaccine hesitancy is currently widespread and acts as a major threat to public health. This paper has explored the efficacy of targeted educational intervention in reducing influenza and COVID-19 vaccine hesitancy. Existing literature supports the idea that targeted educational intervention should be further integrated into current public health
strategies for reducing vaccine hesitancy. Not only have targeted interventions been shown to decrease vaccine hesitancy, but they have also displayed a correlated increase in actual vaccine uptake in the discussed populations. However, it should be noted that lower income communities may not have the resources to implement these interventions, and ways to combat vaccine hesitancy in these areas should be explored in further research.

It is important to note that targeted educational interventions are not mutually exclusive with other interventions, and targeted interventions can be used in tandem effectively with other methods. As vaccine hesitancy increases in prominence, particularly in the wake of the COVID-19 pandemic, the importance of developing effective vaccination programmes has only become more relevant. Despite potentially being a more laborious endeavour than other interventions, targeted educational interventions should be a key component of modern efforts to drive vaccine uptake.

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