Using Education to Overcome Vaccine Hesitancy in People Who Inject Drugs

David Migrandasa Arnopole [a] and Louann O'Dell [b]

[a] King University, 10950 Spring Bluff Way, Knoxville, TN 37932, United States

[b] King University, 1350 King College Rd, Bristol, TN 37620, United States

Migrandasa@gmail.com

Lsodell@king.edu

Correspondence concerning this article should be addressed to

David Migrandasa Arnopole

Phone 865-603-1749

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Abstract

The influenza virus requires vaccination for the world to have some control of the spread of the disease. People who inject drugs are just as likely to reject the influenza vaccine as the rest of the population but are at higher risk for complications from the virus (Lunan, 2020). The purpose of this study was to determine if an educational intervention would decrease vaccine hesitancy in PWID. The sample was from a population of people who inject drugs using a syringe exchange program located in Tennessee. The data were collected from December 2020 through February 2021 (n=310). The study method consisted of a pre- and post-intervention survey in which participants answered questions and told their personal views about the flu vaccine. Educational visual aids were made based on the participants' responses and used to help educate participants about the influenza vaccine before the post-intervention survey. The principal findings showed that individuals educated about the flu vaccine were less likely to see the influenza vaccine, as necessary. Findings showed a decrease of influenza vaccine interest after the educational intervention (52.5% to 36.6%) after the educational intervention. This research concluded that a single educational intervention is not enough to overcome participants' personal beliefs about vaccines. As vaccine hesitancy grows, providers must find and use ways to ensure individuals can overcome this hesitancy to ensure uptake of the vaccines.

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Lunan, C. (2020). 5 false claims about vaccines. Retrieved January 31, 2021, from https://www.novanthealth.org/healthy-headlines/5-false-claims-about-vaccines

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Throughout history, the medical community has battled many diseases plaguing humanity. It was not until vaccines were created that many of these diseases could be controlled, such as smallpox and the influenza virus. Today's vaccines have been researched and developed using safer methods resulting in better control of many diseases (United States Department of Health and Human Services [HHS], 2020a). Many members of the public may lack understanding or worry about the potential adverse effects of vaccinations, leading many to refuse vaccines (Lunan, 2020). People who inject drugs (PWID) were assessed to determine if they were vaccine hesitant, given the opportunity to vocalize their opinion about the influenza vaccine, and then were educated about the vaccine to see if education would alter any vaccine hesitancy present. Education can be used to decrease refusal of vaccines because it helps individuals understand how vaccines work and what vaccines do to protect individuals and groups in each population. Education to those who do not understand why they are at risk of vaccine preventable diseases can also help them to overcome any hesitancy they may have towards vaccines, including the influenza vaccine.

One of the best ways to protect against the influenza virus is through yearly vaccination against the virus (United States Department of Health and Human Services, 2018). Immunized individuals protect not only themselves but also others, resulting in herd immunity. Herd immunity is the concept of creating a buffer of immunized individuals who protect others who are either unable or unwilling to be vaccinated from preventable diseases. Herd immunity, however, is only useful in protecting the unvaccinated if participation among other community members is adequate (Gavi: The Vaccine Alliance, 2020). Refusal of vaccines has become a common issue and is a threat to vaccines' effectiveness and herd immunity (WHO, n.d.b).

Objectives

The objective of this study was to show whether education can alter vaccine hesitancy in PWID. The researcher anticipated that PWID could decrease vaccine hesitancy through personalized education regarding the influenza vaccine. Pre- and post- intervention survey data were compared to determine if the education intervention had an impact on decreasing vaccine hesitancy. Themes related to the participants' views about vaccines were also identified from survey results.

Review of Relevant Scholarship

Vaccines have a history of being both highly effective and controversial. The scientific and medical community have long emphasized vaccines' usefulness in preventing diseases (United States Department of Health and Human Services [HHS], 2020b). With herd immunity, vaccinated people protect those around them who cannot have, or refuse vaccines by creating a barrier for individuals who are resistant to disease. This barrier of resistant individuals makes it more difficult for a pathogen to affect people at risk (Gavi: The Vaccine Alliance, 2020). History has even shown a substantial decrease in infectious rates in many diseases since introducing the vaccine. One disease of note is polio, as it can cause life-long paralysis but has been controlled and almost eradicated with a vaccine (CDC, 2018). There is a need to continue vaccines to ensure the health of the world population.

Scholars agree that the trust of the providers by patients is essential to help decrease vaccine hesitancy. Verger, Bocquier, Vergelys, Ward, and Peretti-Watel (2018) illustrated that patients trusted their providers' medical opinions but did not trust government agencies that created vaccines. Meyer and Lum (2017) also showed an increase in the correlation between provider trust and vaccine use. Kerneis et al. (2017) indicated that 34% of a medical student

body felt ill-prepared to provide education and have discussions about vaccines with patients. Medical providers must increase their confidence with education about the necessity and benefits of vaccines.

Education and shared decision making are critical ways to help decrease vaccine hesitancy whenever possible. Partouche et al. (2019) explained that compulsory vaccines were not effective for increasing vaccine use. This study was compared to medical providers who could teach and help patients make decisions about vaccines rather than enforcing mandated vaccines. Yeung, Lam, and Coker (2016) agree with this as they highlight that understanding of influenza vaccine through education by health professionals, and families can help decrease overall vaccine hesitancy.

Gap in Research

The main gap in evidence was within the population of PWID. PWID were included in multiple articles but were not the focus of the research. These individuals had risks about illicit drug use and fear of being reprimanded or even reported to the authorities by medical providers. Providers need to understand the needs of this vulnerable population, be non-judgmental, and give consistency in the form of supportive and preventative care specific to their needs (Cornford, 2016; Falade-Nwulia et al., 2019).

Research Question

The PICO for this study was: Do PWID (Population) who are educated about influenza vaccine (Intervention) compared to current beliefs (Comparison) show a change in vaccine hesitancy (Outcome)? By answering the question above, the researcher anticipated education would alter the view of PWID about vaccine hesitancy.

Materials and Methods

The design for this study was a pre- and post-intervention survey. Participants answered questions during the pre-intervention phase that focused on their view of the influenza vaccine as seen in figure 1.

Figure 1.

Pre- and Post- Intervention Survey

Visible Gender?

MALE

FEMALE

1) "Are you willing to answer a few questions today?"

   a) YES
   b) NO (Do not ask anymore questions)

2) What is your age range?

   a) 18-28 (If under 18 do not ask anymore questions)
   b) 29-39
   c) 40-50
   d) Over 50

3) Highest level of education completed?

   a) Elementary
   b) Middle School/Junior High
   c) High School
   d) College

4) Did you receive influenza vaccine last year (2019)?

   a) Yes
   b) No
   c) Unsure

5) Do you feel that the yearly influenza vaccine is necessary?

   a) Yes
   b) No
   c) Unsure

6) Tell me your thoughts about you receiving influenza vaccine? (OPEN)

The information gathered was used to create an educational pamphlet and poster to help personalize the intervention, and to answer questions and misconceptions the participants may have verbalized in the pre-intervention survey. The poster was used to help attract individuals to the researcher for additional education. The pamphlet was given during the educational intervention portion of the study. The researcher discussed essential topics about the influenza vaccine during the educational intervention and how it affected PWID. Once the intervention was completed, a post-intervention survey was done in the same manner as the pre-intervention survey. Survey questions used in the post-intervention survey can be seen below.

Design

Phase one of the study was conducted over the two weeks agreed upon with the syringe exchange program director. The researcher approached, greeted PWID, and asked if participants were willing to answer a few questions. If the participants agreed to answer, they were asked the pre-intervention survey. The final question asked the participant to "Tell me your thoughts about you receiving influenza vaccine" to gather data for phase two. The data were gathered over the two weeks of phase one and then reviewed by the researcher for similar topics that would be used in the education intervention.

Phase two education materials were created based on phase one results and the current CDC guidelines (2020a) to personalize the educational pamphlet and poster for phase two. The pamphlet was provided to participants over two weeks during the educational intervention to improve disseminating education. The researcher educated about the influenza vaccine, including how it helped prevent influenza, discussed the side effects of influenza and flu vaccine, and why it was essential to obtain the vaccine regularly. Information was also given about where to find influenza vaccine at no cost.

Phase three of the study was conducted over two weeks agreed upon with the syringe exchange program after the educational intervention phase. A post-intervention survey was completed that focused-on participants' views on vaccine hesitancy. The researcher approached, greeted participants, and asked if they were willing to answer a few questions. If the participants agreed to answer, they were asked the post-intervention survey. The data were analyzed using descriptive statistics and other statistical analysis.

Phase one and phase three surveys were analyzed to correlate demographics, age-range, and the highest level of education. These surveys were compared to participants' view and history with influenza vaccine, receipt of last year's vaccine status, and the influenza vaccine view. The researcher analyzed the results and personal views of participants regarding the influenza vaccine. Once the analysis was complete, a presentation was developed and shared with the organization to disseminate the findings. Demographics included the categorical data of male or female, education level completed, and age range.

Participants and Sample

The PWID population is considered a high-risk population for many diseases, including influenza (World Health Organization [WHO], n.d.a). Within this population, it was well-documented that an individual with an underlying health condition increases their risk for complications of the influenza virus (Day et al., 2010; Sira, Brown, Ambegaokar, Modin, & Kelly, 2019). For example, the influenza virus is one of many disorders recognized to lead to poor outcomes for those who contract the influenza virus (Mayo Clinic, 2019).

The anticipated number of participants required for the study was determined based on the approximate number of people who use the syringe exchange clinic per week. The organization saw approximately 200 participants a week in the syringe exchange program. It

was anticipated that 50% of the participants would agree to the survey, creating a sample of 100 participants. The researcher had a goal of 50% participation from participants who attended the clinic to complete the survey for phase one, the pre-intervention survey, and phase three, the post-intervention survey. All rules and regulations required by the organization, King University, and the Institutional review board were followed throughout the research.

A convenience sample was used as the sampling method due to the simplicity of accessing these individuals with a syringe exchange program (n=310). The demographic information pertaining to the samples can be seen in table 1.

A key demographic that may affect the participants understanding of vaccines is the education level. Most of the participants had no higher than a high school education in both data gathering phases. Also, most people in both phases did not receive the flu vaccine in the previous year. They may not see the vaccine as necessary if they did not have a negative reaction not receiving the vaccine in the previous years.

Setting

The setting for this study was in Tennessee. The organization has a building dedicated to the syringe exchange portion of the organization. In this building, a section was designated for educational materials for any participant to read. The organization was enforcing social distancing by requiring participants who did not commute together to be at least six feet apart while waiting for their turn with the program. The organization decreased the number of people congregating in a single place by requiring an appointment for syringe exchanges due to the COVID-19 pandemic (G. Clark, Personal Communication, May 22, 2020). In January of 2021, this appointment restriction was lifted to allow anyone to come during regular syringe exchange hours.

Inclusion and Exclusion

Implied consent was used for this study. Implied consent occurs when a participant agrees to and continues with any study activities (Cornell Research, n.d.). Participants were approached and asked to answer a few questions. The survey continued only if the participants agreed to answer questions. The individuals who refused or did not meet the inclusion criteria were thanked for their time spent and allowed to leave. While PWID was considered vulnerable, PWID are not restricted from giving consent for participating in the study.

Measurement Tool

Multiple reliable tools have been created to focus on vaccine hesitancy in adults, including the Parents Attitudes about Childhood Vaccines survey tool. The tool was modified by extracting specific questions and altering the wording to focus on the influenza vaccine with the participant rather than their children. Interrater reliability between phase one and phase three participants was demonstrated by surveying the same population of people. The validity of testing was demonstrated by face validity as the items written target vaccine hesitancy and were pulled and modified from the validated tool.

Data Collection

Data collection began in phase one of the project. The pre-intervention survey was printed the day before the survey time with participants. The researcher would then fill out the survey by writing in the blanks under each question while asking the participants each item on the survey. The researcher collected and secured all surveys each day in a lockbox. Upon completion of phase one, the researcher entered the data into a spreadsheet program.

Phase two was the intervention phase of the project and involved the education being developed and presented to participants. The data summarized from phase one part of the presentation in the educational pamphlet and poster.

During phase three, the researcher collected and secured all surveys in a lockbox each day before leaving the site. Upon completion of phase three the researcher entered the data into a spreadsheet program.

Results

The data gathered were used to identify if education influenced vaccine hesitancy in PWID and were obtained through pre- and post-intervention surveys. The first four questions of the surveys gathered information from the participants including gender, age, education level, and if the participant had received the flu vaccine during the 2019 flu season. The results of the four questions were analyzed using descriptive statistics. A chi-square analysis was completed on the question that asked the participants if they felt the vaccine was necessary. The chi-square was used to see if there was a statistically significant change between the pre-intervention and post-intervention groups. The final question was an open-ended question about the participants' view of vaccines. The open-ended question was used to identify themes that could be used in the educational intervention and to compare participant views between the pre- and post-intervention groups.

Descriptive Statistics

Descriptive statistics were used to evaluate demographic data from the first four questions in the survey. There were no significant differences in gender, age range, or education level, found in the results. There was a slightly significant difference ($p=0.09$) between the pre- and post-intervention groups answers regarding whether the participants had received the flu

vaccine last year with 44.4% agreeing in the pre-intervention group, and 35% agreeing in the post-intervention group as seen in table 1.

Chi-Square Analysis

Chi-square statistics were used to compare the pre-intervention and post-intervention groups on question five of the survey, whether they felt the flu vaccine was necessary seen in table 3. The result was 52.5% in the post-intervention group agreed with the question compared to the pre-group at 36.6% as seen in graph 1. There was a significant difference between the groups for thinking the flu vaccination was necessary, in fact the necessity decreased with the post group.

Identifying Themes

Question six of the survey analyzed using descriptive statistics to identify themes of how the participants viewed the influenza vaccine. The answers for the open-ended question at the end of the pre- and post-intervention surveys were reviewed, tabulated, and categorized. A spreadsheet was developed to discuss the themes. Each category was created by summarizing themes in the open-ended question found in the survey. The categories of responses included (a) pro-vaccine, (b) I'm healthy, (c) makes me sick, (d) lack of trust, (e) financial/environmental, and (f) no response. Most topics broke out similarly between the pre-and post-intervention groups. A significance difference was noted in the (c) makes me sick category, showing 19.18% in the pre-intervention group and 29.70% in the post-intervention group. All category results can be seen in Figure 1.

Outcomes

One expected outcome of this research included recognition of increased risk of the flu by PWID. This outcome was not met as many participants continued to verbalize opinions in the third phase of the research about feeling sick from the vaccine as well as a lack of trust.

Explanations for participants not recognizing their increased risk of being affected by the flu include a lack of interest in the education by the participants were or could be related to the difference in population between the pre-intervention group and post-intervention group. One reason for these results could be that the participants may feel as if the influenza virus is not something they should worry about and that their lifestyle choice does not put them at any increased risk. The lack of trust will require time and a close relationship with their providers, if they choose to have one, to overcome the trust issue with the influenza vaccine.

Another outcome of this research was for PWID to understand how vaccines can help decrease their risk of the influenza virus. The responses regarding the participants opinions only had significant changes in one category. The “Makes me sick” category increased from 36.3% to 63.4% after the educational intervention was completed.

Participants may not have understood the education or may not have been willing to change their views with an educational intervention and a pamphlet. They may have felt their lived experiences were more informative about whether they need a vaccine compared to education about how a vaccine could help them avoid the influenza virus. Individuals must be able to overcome these beliefs, but verbal and written education alone may not work to ensure this change of views by participants. Another method of education may need to be implemented to help ensure PWID can overcome vaccine hesitancy.

The third outcome of this research was to determine if education decreased PWID vaccine hesitancy. The original expected outcome was that education in PWID would show a decrease in overall vaccine hesitancy. However, this was not the case in this research. There was a statistically significant decrease in the rate of participants believing that the flu vaccine was necessary from 52.5% in phase one to 36.6% in phase three. This data showed that individuals who were educated as part of the research decreased their interest in the flu vaccine, the opposite of what was expected.

The suggestion of this data is that education is not something that will always work to change a person's mind about health care topics such as vaccines. Factual information and studies may need to be combined with other forms of education and personal experience in order to overcome vaccine hesitancy. Also, serial education may be necessary to ensure participants have time to grasp key concepts of the education.

Recruitment

The implementation of the research spanned between December of 2020 until February of 2021. All three phases used implied consent to allow the participants to continue.

Conclusions

The results from the study showed that vaccine hesitancy actually increased rather than decreased after the educational intervention was completed. Acceptance to view the flu vaccine as a necessity to healthcare decreased from 52.5% to 36.6% comparing pre- and post-intervention phases. This may be because of the perception of decreased flu occurrence during the COVID-19 pandemic even though they may not have received the vaccine.

Many of the participants may feel like the flu is not dangerous compared to the COVID-19 pandemic. According to the CDC (2021c), a decrease has been noted in flu diagnoses peak

from 7.1% of the United States population in the 2019-2020 flu season to a peak of 1.5% in the 2020-2021 flu season. This has been attributed to increased handwashing, personal protective equipment use including regular mask use, and increased uptake of the flu vaccine.

During the research individuals were able to verbalize their feelings about the flu vaccine being necessary both before and after the education occurred. The topics verbalized by participants during phase three showed a decrease in understanding of how vaccines work. There was a notable decrease in individuals who categorized themselves as “pro-vaccine” and “I’m healthy” between phases one and three. There was also a notable increase in individuals who felt the flu vaccine “Makes me sick” from 19.18% to 29.7%.

These changes could be due to personal preference that was not overcome by the educational intervention. Participants may not have had a willingness to learn as vaccines were a controversial subject during the COVID-19 pandemic. There were changing regulations put forth by various organizations such as the CDC. Vaccines also became a political topic that many organizations had differing views on (Kaplan & Milstein, 2021). Political views could have also altered the view of necessity of the vaccine. Cognitive learning theory requires a willingness to adopt new information and this population may not have been open to that during the syringe exchange.

The organization where the research was conducted was interested in using the results to apply for grant money for increasing availability of medical treatments. By understanding if their clients were interested in medical treatments, they could apply for funding to ensure access to preventive care including vaccines.

The organization can use the results to show a need for additional interventions to help the population understand their healthcare needs beyond just verbal education. Public opinion

and participants view on vaccines need to be overcome using other methods to ensure that vaccine hesitancy is overcome, especially in these high-risk population.

Further interventions including education should be used to ensure an increased understanding of the purpose of the flu vaccine. The educational material including the poster and pamphlet can be used to help continue said education about the flu vaccine as well as the risk PWID have when they do not have the flu vaccine. One method to help reinforce understanding is that of serial education. By continuing to educate the population about their risk for complications from the flu virus due to their lifestyle on more than a single occurrence, individuals may be able to overcome vaccine hesitancy.

While participants were willing to listen to the education provided, vaccine hesitancy actually increased. While hesitancy increased, this research shows that education cannot be the only tool used to overcome hesitancy. Educating individuals with facts, even if created to overcome the participants' false views, can increase participant hesitancy. Overall, the vaccine hesitancy is not something that was overcome with this study. While education should help people understand how vaccines work, vaccine hesitancy cannot be overcome with a single educational intervention. A lack of understanding may not be the only barrier to overcoming vaccine hesitancy. Further studies are necessary to identify the cause of vaccine hesitancy, followed by research about what types of education work best in the PWID population. This study can help guide future studies of overcoming vaccine hesitancy by showing the need for further research on different interventions.

The continuation of this research is important due to the current state of vaccine hesitancy in the United States. As vaccine-preventable diseases that were once considered controlled begin to reemerge and new disease variants such as COVID-19 setup in the population, vaccine

hesitancy must be overcome (D'Souza & Dowdy, 2021). Based on these results, different methods of educating a population, especially those at high risk of complications like PWID, must be considered and researched to find the best methods to overcome the hesitancy to the vaccine. Other vaccines could also be used in research to find out if specific vaccines cause more hesitancy compared to others. Research could also be conducted on whether individuals can identify falsehoods or policy information about vaccines.

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Tables and Figures

Table 1

Demographics of Pre- and Post- Intervention Groups

Variable	Pre-intervention	Post-intervention	*p*-value
Gender (female)	74 (50.7%)	78 (44.1%)	0.24
Age			
18-28	21 (14.4%)	22 (13.4%)	
29-39	66 (45.2%)	63 (38.4%)	
40-50	38 (26.0%)	60 (36.6%)	
Over 50	21 (14.4%)	19 (11.6%)	0.25
Education			
Elementary	1 (0.7%)	1 (0.6%)	
Middle school	26 (17.8%)	39 (23.8%)	
High school	92 (63.0%)	104 (63.4%)	
College	27 (18.5%)	20 (12.2%)	0.34
Flu vaccine last year	64 (44.4%)	57 (35.0%)	0.09

Note: The pre-intervention group had a sample size of 146 and post-intervention group had a sample size of 164.

Figure 1

Percentage of Topics Presented by Participants Regarding Their Thoughts on the Influenza Vaccine Before and After the Educational Intervention