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Don’t Forget: Teens need vaccines: A quality improvement project to improve vaccine uptake in the adolescent population.

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By

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Abstract

Research has shown that there is a significant decline in the number of adolescents who visit their primary care provider after the age of 16, in both male and females. Consequently, there has been a decline in the number of adolescents who receive preventative care, which includes routine immunizations. A comprehensive literature review demonstrated that there are several factors that lead to the decline in adolescent primary care visits and poor vaccine uptake. The proposed action plan was to create an educational campaign that can be used in primary care clinics or be delivered through educational facilities directly to the specific population such as high schools. Objectives for the project included identifying barriers and misconceptions within the adolescent population as well as identifying the most effective methods to deliver evidenced based information to the adolescent population. The Health Belief Model was used as the conceptual underpinning to help guide researchers in identifying attitudes and beliefs, as well as common barriers to vaccine uptake within the adolescent population. The proposed study was conducted through two phases. The first phase involved collecting data using surveys within the adolescent population. The data collected initiated the second phase which included the development of an educational campaign. Data collected from the study was used to develop an educational campaign that can be used to deliver age-appropriate and evidenced base information to adolescents in multiple settings by healthcare providers and educators.

Table of Contents

Introduction

The current literature states that there has been a steady decline in the number of adolescents who visit their primary care provider after the age of 16 for preventative care visits (Rand and Goldstein, 2018). Similarly, research demonstrates that a majority of healthcare visits for adolescents are acute care or follow up visits (Rand, and Goldstein, 2018). The decline in preventative care is substantiated by a decrease in vaccination rates amongst the adolescent population. A comprehensive literature review also demonstrates that there are several multifactorial aspects that contribute to poor vaccination uptake within the adolescent population. These factors include a lack of awareness within the adolescent population in regard to vaccines, parental hesitancy, lack of strong provider recommendations, as well as socio-demographic factors that may pose barriers to healthcare utilization in the adolescent population.

The Advisory Committee on Immunization Practices (ACIP) develops the recommendations for health care providers in regard to vaccination schedule for specific age groups. Similarly, the ACIP and the Center for Disease Control and Prevention (CDC) track the vaccination rates for adolescents within the United States through programs such as the national vaccination coverage survey. This data has been helpful in recognizing vaccine trends and identifying gaps within specific age groups to develop appropriate interventions. The recommended vaccines for the adolescent age group ranging from ages 11-12 include the pertussis, diphtheria, and tetanus vaccine (Tdap), human papilloma virus vaccine (HPV), and meningococcal vaccine for serogroups ACWY. The ACIP also recommends the meningococcal serogroup B vaccine for those ranging from ages 16-23. It is important to note that these vaccines are especially important for the adolescent population.

Data from the national coverage for vaccinations of 2019 within the adolescent population showed some improvements from the previous years. Subsequently, there continues to be discrepancies between the booster shots of certain vaccines such as the HPV and the meningococcal B vaccine. Coverage of the HPV vaccine increased by 3% from 2018 to 2019 and the MenACWY vaccine increased by 2.3% in 2019 (Alams-evan et al., 2020). Alams-evan et al. (2020) report that the vaccination rate for the meningococcal B vaccine for 2019 was 21.8%, which is low when compared to the meningococcal ACWY, which had an uptake of 53.7%. Coverage rates for the Tdap vaccine had an uptake of 90.2%. Data from these national reports are important when making recommendations. For example, data from the coverage report showed that many parents were more open to HPV vaccination at age 13 instead of the recommended age range of 11-12 and that those living in metropolitan areas had higher coverage rates that those living outside of the metropolitan areas or below poverty levels.

Through an extensive literature review, it was discovered that the issue of poor vaccination rates in the adolescent population is linked to multiple factors such as to issues relating to poor education, awareness, parental hesitancy, and social disparities. Loke et al. (2018) mention that education is a pre-requisite for making informed decisions. Similarly, that education and knowledge is strongly linked to vaccine uptake. Many adolescents had some awareness on the HPV vaccine but limited education on the HPV infection, cervical cancer screening, and genital warts. Strivastava et al. (2020) identified that a large group of parents and adolescents within the United States are unaware of the importance of the meningococcal B vaccination for adolescents. Secondly, parental hesitancy has been connected to poor vaccine adherence rates within adolescents. The issue of parental hesitancy has been associated to the fact that many adolescents look up to their parents when making informed decisions about their

health. Esposito, Principi, and Cornaglia (2013) mention that lack of education in parents is a big contributor to parental hesitancy. Many parents demonstrate poor education when it comes to vaccine preventable diseases, safety and adverse effects, and lack of understanding of the vaccine schedules (Esposito et al., 2013). Many adolescents follow advice and reach out to their parents for questions in regard to their health. Similarly, many parents strongly rely on health care providers for recommendations on vaccinations. Bernstein and Bocchini (2021) mention that many parents reported feeling more comfortable accepting vaccines (48.9% compared to 33.6%) when a recommendation was given by a healthcare provider. For this reason, a united front by health care providers is strongly recommended.

Strivastava et al. (2020) mention that socioeconomic status and race also play an important role in vaccine adherence. For example, non-white Hispanic individuals were found to have a decrease in the adherence rate for the meningococcal B vaccine, when compared to white, non-Hispanic individuals. It is vital that providers understand common misconceptions that lead to parental hesitancy so that these topics can be addressed with great detail within each visit. Lastly, there are logistical issues that lead to a lack of vaccine adherence within the adolescent population. Some these issues include cost of vaccines, lack of insurance, inability to get to clinic for healthcare appointments. The literature shows that efforts to increase adolescent vaccination rates are necessary to reduce long term complications within the population. The proposed action plan is to create an educational campaign that can be used in primary care clinics or be delivered through educational facilities directly to the specific population such as high schools.

Summary of the literature related to the clinical question

Theme 1: Understanding trends in adolescent primary care visits.

To understand how to improve vaccination rates in adolescents, one must gather data which includes the trends in rates of which adolescents visit their pediatrician for preventative care. Gathering data can help nurse practitioners identify the best time to provide education and promote vaccine utilization. Rand and Goldstein (2018) mention that understanding patterns of healthcare utilization is a major way to understand vaccine adherence within the adolescent population. Research has shown that adolescents ranging from 11-12 years of age are more likely to visit their pediatrician for preventative visits. In two different studies focused on identifying visit patterns for adolescents it was found that the age group of 11 to 12 years of age had the highest rate of preventative care visits as well as the highest rate of HPV vaccination rates (Rand & Goldstein, 2018; Nordin et al., 2010).

Vaccination rates per type of visit were also examined. Rand and Goldstein (2018) found that the highest percentage of immunizations were administered at preventative care visits (61%), when compared to immunization only visits (26%), and follow up or sick visits (12%). Other influential factors included gender, income, and insurance coverage. In research studies regarding healthcare visit patterns, age was determined to be an influential factor. In regard to gender, Nordin et al., (2020) longitudinal analyses showed that the average number of preventative and non-preventative visits was higher for females when compared to males. In regard to income, those within the lower socioeconomic had significantly less rates of healthcare visits when compared to those of higher income levels (Rand & Goldstein, 2018). Subsequently, there was no difference between those who had private or government-based insurance in regard

to both preventative and non-preventative primary care visits. In comparison, individuals without insurance were most likely to have less than one preventative primary care visit per year.

Rand and Goldstein (2018) mention that interventions need to be developed and targeted to improve preventative care rates which would subsequently improve vaccination rates amongst adolescents. Methods to increase vaccination rates can be made to target adolescent's during non-preventative visits such as sick and follow up visits. This study emphasizes the importance of planning ahead so that providers can be prepared anytime an adolescent patient visits their primary care provider. This can be accomplished through recall services, electronic health record reminders, and standing orders. Education to healthcare providers on methods to educate adolescents and the clinical staff is also crucial.

Theme 2: Perception and education of vaccines in the adolescent population.

Understanding and identifying the perceptions and previously established knowledge on vaccinations is also crucial in the development of interventions and the delivery of care. Many studies have focused on identifying the parents' perspective of vaccines but there has been little research conducted on the way that adolescents perceive vaccines. Additionally, many of the research and attention has been focused on vaccines such as HPV, which has created a knowledge gap between other vaccines, for example, the vaccine that protects against meningococcal B disease (Srivastava et al., 2020).

Part of the literature review also focused on identifying research which looked into the perceptions and attitudes of adolescents and vaccines. Blanchard et al. (2019) focused on conducting a study that measured an adolescent's perception of vaccines using a pre- and post-test. The study showed that healthcare providers do not have many opportunities to provide education to adolescents in regard to vaccines due to the fact that many adolescents seek care for

non-preventative visits. The literature also disclosed that adolescents are also becoming increasingly interested in participating in the decision-making process of their care. Data from the literature showed that adolescents value the opinion of their parents, physicians, peers, and social media when looking for recommendations on vaccines.

Through educational sessions, researchers explored topics such as vaccine hesitancy, barriers to knowledge, and vaccine safety and risk (Blanchard et al., 2019). Data from the literature showed that many adolescents are not aware if they are up to date on their vaccines. A similar study analyzed an adolescent's perceptions and knowledge of a different range of vaccination and infectious preventable diseases. Hilton et al. (2013) mention that further research should focus on understanding adolescent's perception of vaccines. Researchers also mention that due to the success of vaccinations many adolescents have not been exposed to many of the dangerous diseases that have been eradicated, which requires the need for extra consideration and awareness.

Common themes were identified by Hilton et al. (2013) which included perception of diseases, understanding and concerns of vaccines, experience on obtaining vaccines, and beliefs about choices, responsibility and decision making. Through the study, researchers were able to address misconceptions regarding to preventable diseases such as the severity of meningitis and genders affected by HPV, as well as gain input on both the positive and negative experience of receiving vaccines. The severity of the infectious disease also made a big impact on the perception of a vaccine for adolescents. After analyzing the data, it is clear that there has to be an emphasis on the education that is provided to adolescents on both vaccines and preventable infectious diseases.

Moreover, many studies have also demonstrated that adolescents look to their parents and healthcare providers for advice when making health-based decisions. The literature states that parental vaccine hesitancy has had a strong correlation to poor immunization rates amongst adolescents (Micheals-Igbokwe, Macdonald, & Currie, 2017). Esposito, Principi, and Cornaglia (2013) discuss barriers created by parents and health care providers in regard to immunization. Some of the most common barriers regarding parental influence included a lack of knowledge, concerns of adverse effects, difficulties comprehending the vaccine schedules, and logistic factors including time and cost (Esposito et al., 2013). Common barriers within providers included lack of knowledge on the indications and contraindications of vaccines, personal interest, and a lack of knowledge on recommended guidelines. Research has also focused on identifying barriers within age-related specific vaccines such as HPV. In a study by Widman et al. (2016) it was found that common parental barriers to the vaccine were misconceptions related to the promotion of sexual activity, vaccine safety, cost, as well as a lack of strong provider recommendations. Providers must also be aware of the common parental misconceptions when providing proper education.

Theme 3: Developing age-appropriate interventions to target the adolescent within primary care.

When conducting the literature search it was also important to search for research that focused on previously established methods and interventions to improve vaccination rates amongst adolescents. The first objective was to identify the best methods to deliver aged-specific education and interventions to the adolescent population. One way of doing so can be through school led education campaigns. Blanchard et al. (2019) identified that a vital way to target adolescents was through school led educational session. Researchers wanted to identify the most influential ways to deliver information to adolescents. Some of these methods included

interactive scenarios focused on addressing potential complications, presentations about local statistics, and graphic images. Data was collected through pre- and post-tests. The data from the research demonstrated that students were positively impacted by the information provided at the educational sessions. The results from the education sessions demonstrated improvement in scores in regard to questions about feeling more confident, informed, and the ability to obtain credible information about vaccines.

Providers have also been interested in identifying the best methods to increase immunization adherence amongst adolescents. Stokley (2015) conducted an analysis of eight articles that focused on improving vaccination rates of adolescents within primary care clinics. Two of the studies used technology methods, such as tablet-based questionnaires, to address parental and adolescent concerns in regard to vaccines. This data was then used to educate the clinical staff on the most effective ways to communicate information to the parents and adolescents about upcoming vaccines. Other methods included recall messaging system through the phone or physical postcards. These research articles identified that recall methods are useful in having adolescents return for follow up booster shots but yielded little result in influencing adolescents and parents to make appointment for first time vaccine doses.

Lastly the use of school-based vaccination clinics was analyzed. Evidence from research articles showed that parents in low to middle income households were open to the idea to school-based vaccination programs. Limitations of the school-based programs were seen in families of Hispanic, Somali, and Ethiopian populations who had misconceptions about the importance of vaccines from their home country (Stockley, 2015). Recommendations included educating local providers on specific cultural vaccine misconceptions so they could be addressed with the families during primary care visits.

Theme 4: Addressing gaps within the literature.

Analysis of the current literature has demonstrated that much of the research has been focused on improving adolescent vaccination rates of the HPV vaccine. A common theme within the literature search was the little research focused on the adherence, perception, and knowledge of the meningococcal B vaccine amongst adolescents. It is important to note that there has been increase in adherence of the HPV vaccine due to the attention of major stakeholders such as governmental agencies, healthcare providers, as well as the mass media. When compared to the other adolescent vaccines, which include HPV and Men ACWY, the MenB has a significantly less rate of adherence, which could be attributed to the age in which the vaccine is recommended (Alam-Evans et al., 2020). Currently the ACIP recommends the MenB vaccines to those in between the ages of 16 to 23. This is a vital age group who is preparing to attend college and one in which full adherence to the immunization schedule is of great importance to prevent lifelong complications.

Current research states that many parents and adolescents are unaware of the MenB vaccine (Strivastava, 2020). Furthermore, research has shown that there is a big knowledge gap of the MenB vaccine between Hispanic and non-Hispanic communities, as well as those within low socioeconomic status. The study demonstrated that with proper education many parents and adolescents of various ethnic background and socioeconomic status were interested in obtaining the MenB vaccine. Ultimately research on the perception and knowledge of the MenB vaccine is minimal which indicates that is a topic of research that requires special attention.

Purpose/ PICO Clinical Questions/Objectives

The purpose of the project was to create an educational campaign that delivers evidence-based material that is easy for adolescents to comprehend and retain, with an end goal of increasing vaccine uptake. To improve this issue multiple areas needed to be addressed. The first was a lack of awareness and poor education within the adolescent population. The second was the recognition that both parents and healthcare providers play a role in vaccine adherence within the adolescent population. The goal was to increase awareness within the adolescent population to increase the conversation within the household. A second objective was to reduce parental hesitancy and improve provider recommendation through evidence-based information. The goal for the project was to identify, collect data, and recognize the most effective delivery methods to promote vaccines and promote autonomy by allowing teens to make conscious and informed health decisions.

PICO question:

Are P= adolescents who are educated on I= age-appropriate immunization, C= when compared to those who do not receive education, O= more likely to obtain vaccines prior to starting college?

Objectives:

- Reduce and identify common barriers and misconceptions within the adolescent population relating to vaccine adherence.
- Deliver evidence-based and age-specific educational material to adolescents.

- Develop an age-specific educational campaign that promotes vaccine adherence and utilization in adolescents.
- Deliver evidence-based information to parents and providers to reduce misconceptions and increase dialogue about adolescent vaccinations within primary care.

Definition of Terms

I. Adolescents: determined as the biological and physiological start of puberty to adulthood. (Age range 11-21).

II. Center for Disease Control and Prevention (CDC): Federal governmental agency responsible for preventing and controlling disease, injury and disability.

III. Vaccines: a substance which mediates an immune response to stimulate the production of antibodies and develop immunity to specific disease.

IV. Advisory Committee on Immunization Practices: Committee under the Center for Disease Control and Prevention which regulates and sets standards and guidance on the use of vaccines.

V. Pertussis, Diphtheria, and Tetanus vaccine (Tdap): Prevents against bacterial infections caused by Bordetella pertussis, Corynebacterium diphtheria, and Clostridium Tetani. Infections that lead to the development life-threatening diseases such as of whooping cough, diphtheria, and lockjaw.

VI. Human Papilloma Virus Vaccine (HPV): Vaccine that projects an individual against HPV strains that lead to cervical, anal, vulva, vagina, oropharynx cancers and the strains that lead to the development of genital warts.

VII. Meningococcal ACWY: Vaccine that helps project against the bacteria Neisseria meningitis which prevents against meningococcal serogroups ACWY which lead to meningitis.

VIII. Meningococcal serogroup B vaccine: Vaccine that helps project against the bacteria Neisseria meningitis which prevents against meningococcal serogroups B which lead to meningitis and is more prevalent in late adolescence and young adults attending college.

Conceptual Underpinning and Theoretical Framework of the Project

The conceptual underpinning for the project was the Health Belief Model (HBM). The Health Belief Model was used to guide the project and aid the researcher in understanding the behaviors that limit adolescents from obtaining vaccines. Similarly, the model also helped explore behavior constructs that guide adolescents to be more open to vaccines. The foundation of the model is based on several constructs that explain human behavior. An example can be seen in the abstract section: Figure 1. The constructs explain that individuals are more likely to change and prevent illness if one feels more susceptible to the condition, the severity of consequences of disease, and if the course of action chosen would lead to better outcomes (Jones et al., 2015). Other factors of significance within the HBM include barriers, self-efficacy, and internal and external factors such as symptoms and risk of exposure.

The HBM was beneficial for the project because it identified specific behaviors and perceptions that inhibit adolescents from obtaining vaccines but also identify behaviors and cues that help providers educate both adolescents and parents. Comparably, the HBM has been used by many researchers to study the behavior of several different populations and the acceptance

and willingness to obtain certain vaccines. For example, Marcell and Spurlock (2020) used the HBM to identify barriers and beliefs of college students and the influenza vaccine. By using the HBM, researchers were able to identify the need for the development of evidenced based cultural interventions targeted towards undergraduate college students.

The HBM has also been used to study adolescent's perception of vaccinations. To guide the project, the framework developed by Gargano et al. (2014) was also used. The theoretical framework, seen in Figure 2, was developed with the focus on the Health Belief Model and the Theory of Reasoned Action. Researchers believe that using ideology from both models, such as the use of the constructs of perceived susceptibility and severity from the Health Belief Model, as well as understanding the rationale behind adolescent vaccine behavior through the use of the Theory of Reasoned Action were beneficial in identifying how to best education adolescents on vaccinations and increase utilizations.

The theoretical framework was useful for the project because it focused on concerns within the specific population. Some of these include background, which include socio-demographic factors. Researchers concentrated on attitudes and beliefs of vaccinations by focusing on identifying common threats, expectations, and social norms within the specific population. The common goal was an increase in uptake of adolescent vaccinations. To increase vaccination rates amongst adolescents, the project focused on identifying various barriers and expectations to vaccine uptake within the population by focusing on adolescents, parents, and health care providers. The theoretical framework developed by Gargano et al., (2014) along with the Health Belief Model was also used to help guide the project. Using both the HBM and the

framework as the conceptual basis for the project helped identify limitations and barriers but also aid in the development of evidenced based interventions for healthcare providers.

Methodology

Plan Phase:

Study design:

The methodology for the research of this project consisted of a mixed method research design with a focus on surveys for data collection. Keeping in line with the Health Belief Model, the methods of data collection included the use of surveys and pre- and post-test to evaluate the participants beliefs and perceptions of vaccines and help identify common barriers. The use of a pre- and post-test is beneficial in identifying future key constructs that helps the researcher identify the perceptions and beliefs of adolescents in terms of vaccine adherence. Data from the surveys can also be used to educate health care providers on how to deliver data to the adolescent patient.

Setting/ Location:

The survey recruitment process consisted of adolescents using the snowball sampling method. A recruitment poster was been created to help facilitate the researcher (Figure 5). Due to the COVID-19 pandemic, much of the surveying and recruitment was done through the use of electronic and media platforms. Online platforms such as Zoom, and Microsoft teams could also be used for presentations and meetings.

Sample:

The sample consisted of adolescents ranging from ages 11-21. A survey was presented to adolescents. The goal was to get a sample size of approximately 15-60 participants within the study.

Inclusion criteria:

Creating an inclusion criterion for the study helped yield the most reliable results but also helped prevent bias. The selection of participants was done with special care and attention to promote the purpose, objectives of the study as well as follow the PICO question. The inclusion criteria for the study included 1) adolescents ranging from ages 11-21 2) adolescents enrolled within a high school 3) parents of adolescents ages 11-21. Special attention was focused on the sample to avoid limiting the generalizability of the study.

Exclusion criteria

Similarly, to prevent bias and risk the validity of the project an exclusion criterion was created. The exclusion criteria for the project included 1) adolescents with pre-existing medical conditions which limit their ability to obtain vaccines 2) adolescents with religious exemptions to vaccinations, 3) adolescents who are unable to obtain vaccines due to previous adverse reaction (anaphylaxis) to vaccines.

Measures/instruments:

Online resources such as Survey Monkey and Google Forms were used as effective and reliable sources to collect data from participants. These resources are also beneficial considering

that they are user-friendly and recognized by the majority of the population. Through the use of a link, the survey was distributed, which allowed the researcher to collect data in a quick and efficient manner. Data from the surveys was then broken down and assigned to a category based on the Health Belief Model to develop a framework used to cultivate the educational campaign.

Important factors of the research included the validity and reliability of the tools used. The pre- and post-test helped establish internal validity, which was to identify if educational campaigns can help influence and adolescents' perceptions and increase the uptake of vaccines. Data collected from the direct population and from health care providers establish validity by enhancing the credibility of the study itself. Secondly, to avoid threats to the external validity and generalizability of the study, the researcher attempted to prevent the use of a convenience sample of high school students. Analyzing the demographic data of the participants was important to avoid this limitation. Obtaining a sample of various demographic participants helped establish the generalizability and external validity of the study.

Data collection procedures:

For the surveys, data was collected by sending the electronic link of the survey to the participants. The answers from the survey were analyzed through the use of the Qualtrics method in a way which revealed the participants response as well as basic statistical data.

Data analysis:

Statistical methods were also used to analyze the data from the surveys. The clinical question was focused on identifying if education can be used as a tool to improve adolescents' perceptions and attitude towards vaccines with a goal of increased uptake and adherence. The

pre- and post-test can be used to collect data prior to the start and at the end of the educational intervention. Data from the surveys was categorical and broken-down using constructs from the HBM. A framework was then developed through the dissemination of the data. Data from the educational campaign can then be analyzed by using a two-sample group, the statistical data can be compared from the same group before and after the intervention has been conducted. Data can be run and calculated through IBM SPSS statistics applications. The paired t-test can be useful in determining the statistical significance of the data as well as establish validity for future studies.

Protection of human subjects:

The protection of human subjects for the study was established using Florida International University's IRB approval. Through this process, an informed consent was created for those participants who would be partaking in the surveying process. An informed consent was also collected from the parents of those who were under the age of 18. Educating both the participants and parents was crucial to the project. It was important to obtain informed consent so that participants and their parents understood how their information would be used. The informed consent can be seen in Appendix A under Figure 7.

Goals from the study included identifying barriers to vaccine adherence in adolescents and to also identify methods of effective delivery and communication, as well as how to promote vaccine adherence within the adolescent population. As it was previously mentioned, education is a pre-requisite in making informed health decisions. The issue of vaccine adherence is multifactorial but can be addressed by getting to the root of the problem, promoting education, and awareness. Subsequently, data obtain from the research problem was then used to develop

interventions that help providers communicate and educate their adolescent patients to improve the issue of vaccine adherence in the long run.

Dissemination plan:

The dissemination plan for the DNP project was to create an abstract which can be presented in future poster or podium presentations, as well as be submitted in various peer-reviewed journals. The following includes a list of possible future poster/podium events and peer-reviewed journals for submission.

Events:

1) 2022 National Association of Pediatric Nurse Practitioners National Conference

2) 2022 Fifteenth National Doctor of Nursing Practice Conference: Tampa, Fl

Journals:

1) The Lancet: Child & Adolescent Health

2) Journal of Adolescent Health

3) Journal of Pediatrics

Timeline:

Figure 4 depicts the working timeline for the DNP project proposal. Semester one is demonstrated by the development of the clinical problem, PICO question, and a thorough literature review. Upon completion of the first semester, the project was approved by the lead

faculty and the student transitioned to the second semester of the DNP track. The second semester is marked as the beginning of phase I for the project as well as IRB approval.

Intervention:

Phase I: Survey and data collection

Phase I of the project included surveying participants. Surveys were created using constructs from the Health Belief Model to understand perceptions and barriers to vaccine uptake within the population. Several themes that needed to be understood included perceived susceptibility, an adolescent's perception of acquiring the disease, severity of infectious preventable diseases, benefits of vaccines, and identifying barriers. Figure 3 demonstrates the survey that was used.

Monitoring Data:

Surveys were collected and kept in protected files by the investigator. As more surveys were collected, data was analyzed and used to identify common themes using the Health Belief Model, such as general knowledge, perceived severity, and susceptibility.

Implementation:

As themes were classified, data could then be used to strengthen the validity of the educational campaign. The rough draft of the educational campaign and pre- and post-test were based on data collected through an extensive literature review. As data was collected, questions and educational material were modified to specifically target the appropriate age group.

Troubleshooting:

The investigator promoted credibility by presenting credentials and expertise in the field, as well as presenting evidenced based data gathered through an extensive literature review. Common questions and misconceptions were also addressed.

Common questions that may arise by parents/participants:

1) How will this information be used?
    a. The information gathered from the surveys will be anonymous. The goal of the survey to is to understand how adolescents of various age groups perceive vaccines as well as gather information on general knowledge of vaccines. Data from the surveys can also be used to educate health care providers and educators.
2) Are there any risks in participating within the study?
    a. The study poses no risks, harms, or discomfort through participation including physical, psychological, social legal or economic.
3) Will any of my child's/participants medical information need to be released or used?
    a. The study will not involve the use of medical data or the use of the participants medical records. The purpose is to gather information through the use of surveys and gain an insight to an adolescent's perceptions on vaccines.
4) Will the survey influence the participant to make decisions they do not want to?
    a. The survey does not include medical advice or recommendations. The purpose is to gather data on how vaccines work, their safety, and efficacy. Any questions participants may have about vaccines may be discussed with their primary care provider.

5) Will the participants responses be publicly displayed?
    a. Information from the survey will only be viewed by the investigator and will be analyzed using the Health Belief Model to create an educational intervention to teach adolescents, and health care providers. Direct responses may be visually displayed in future presentations but will not include any personal identifiers.

Results:

PHASE I: Survey and data collection.

Upon approval of the IRB protocol, the investigator began surveying participants for phase I of the project. A survey was prepared using the Health Belief Model with targeted questions to gather data on general vaccine knowledge. Survey questions focused on addressing two key vaccines with poor adherence rates in adolescents, such as the HPV and meningococcal vaccine. Additional questions focused on addressing the susceptibility to infectious diseases, understanding of how vaccines work, the severity of infectious diseases, safety, and efficacy of vaccines. Parental and provider influences were also addressed, as well as barriers to vaccine uptake. Participants were also encouraged to include comments through a free text responses option on the survey.

Data analysis and exploration of themes

1) Data collection:

Using the Health Belief Model, the researcher used questions to understand adolescents' perceived susceptibility to disease, perceived severity of diseases, common barriers, and adolescents' self-efficacy. Sociodemographic data from the survey included the age and gender of participants. There was a total of 21 participants. The age range of participants was 11 to 21. The total number of males was eleven and females was ten. The first part of the survey was

designed to understand the participant's general knowledge of vaccines. The second part of the survey was used to gather data on the perceived susceptibility of adolescents and the severity of infectious diseases. The questions focused on identifying if participants understood the importance of vaccines for all populational groups. To understand perceived severity, questions were addressed towards identifying the knowledge of preventable infectious diseases and the implications of health consequences in the future.

The third part of the survey was to identify common barriers and self-efficacy within the adolescent population. To identify barriers, the survey included questions to understand the influences of social media, health care providers, and parents. To address self-efficacy of the adolescent population, questions focused on identifying if the health choices of adolescents were driven by their own decisions and opinions versus those of their parents or health care providers. The final section of the survey was a free text option that was oriented towards identifying what would deter adolescents from obtaining a vaccine and recommendations for health care providers. Graphs and tables are located within appendix B.

2) Theme analysis

General Vaccine knowledge

A majority of the adolescents understood or had a minimal understanding of how vaccines worked. 90.5% of participants reported that they understood the functionality of vaccines. 66.7.% of participants reported that they were up to date on all their vaccines (Figure 13). 19% reported that they were not up to date and 14.3% was not sure of their vaccination status (Figure 14).

Perceived susceptibility: Is my age group at risk?

The majority of the participants agreed that vaccines are important within the general population, including young children and adolescents (81%). 19% answered that vaccines are essential for all age groups. 9.5% answered that vaccines were only important for young children, and 9.5% believe that vaccines are only essential to get as teenagers (Figure 15). Regarding the importance of specific vaccines, 52.4% of participants believe that some vaccines have priority and are more critical than other vaccines, whereas 42.9% disagree (Figure 16). 81% of adolescents understand that there are vaccines that are important to receive before attending college.

Perceived severity: Understanding the severity of preventable infectious diseases.

A majority of participants had a good understanding of the implications of infectious diseases and their consequences. Participants understood that being young and healthy was not a determinant in preventing long term consequences of infectious disease. 95.2% of participants did not let their health status (healthy and young) influence the outcome of acquiring an infectious disease in the near-present or future (Figure 17). Similarly, 76.2% of participants believe that the chances of acquiring a preventable infectious disease in their age group are still high, 23.8% did not believe that there was a high chance of acquiring a preventable infectious disease in their age group (Figure 18).

On the other hand, the specific population group did not know the implications of the vaccines given during the adolescent years, such as the meningococcal B vaccine, ACWY, TDAP, and HPV vaccine. Specific questions were geared towards recognizing if the participants had previous knowledge on individual vaccines by answering if they had a good understanding, a little knowledge, or did not know about the vaccine. 66.7% of participants did not know what

the meningococcal B vaccine was for, and 19% had little knowledge of the vaccine. 80% did not know what the meningococcal ACWY vaccine was for. 52.4% of participants did not know what the Tdap vaccine was for. 38.1% did not know what the HPV vaccine is for, whereas 42.9% had little knowledge of the HPV vaccine. Less than 20% of participants reported a good understanding of the HPV and meningococcal vaccine (Figure 19).

Perceived barriers:

Most of the participants (61.9%) did not agree that there has been more talk in the media about pediatric vaccines not related to COVID-19 (Figure 20). 61.9% of the population agreed that their pediatrician/health care provider provides sufficient information on vaccines (Figure 21).

In the free-text section, the participants were allowed to express any justification that would deter or influence them receiving a specific vaccine. The answers in the free text section included a variety of responses that had one common theme. Regarding side effects, 57.1% of the participants answered they are concerned about side effects but still choose to get vaccinated, whereas 23.8% have concerns about certain vaccines' side effects that dissuade them from getting vaccinated (Figure 22). Most participants expressed a fear of the side effects of vaccines or health consequences in the future.

Self-efficacy:

To identify the self-efficacy of the age group, questions were targeted to identify the nature of health-choices and the thought process for the adolescent population. 52.4% of the subject group chose to make their own health-conscious decisions, 38.1% of participants base their vaccination status on their parents' decision or because it is required for school (Figure 23). When it came to the person the subject group trusted most when making important health

decisions, 47.6% of participants answered that they would listen to their parents, and 42.9% would base their decision on their pediatrician (Figure 24). 85.7% of the subject group answered they visit their PCP for both well and sick child visits (Figure 25).

Similarly, participants were given a chance to offer recommendations to health care providers regarding vaccines. The main consensus included those participants would want further explanation on the reasoning behind the vaccine and more time dedicated to explaining what the vaccine is used for. Specific answers included more time explaining what each vaccine is for and spending time teaching more about vaccines in classrooms or hosting education sessions for vaccine education (Figure 26).

Trends within the data:

Trends within the data were analyzed and tracked. These trends were focused on sociodemographic factors between the participant group. Some trends were observed when analyzing the data. Some of these included identifying patterns between gender and age groups, including early and late adolescents. For example, it was identified that a majority of males did not believe that vaccines were necessary to receive before attending college. Similarly, the age pattern of those who did not believe they were at risk of catching infectious disease was within the early adolescent age group (ages 12-14).

Regarding the knowledge of infectious diseases and their vaccines, it was identified that there was a severe knowledge gap between the meningococcal vaccines. Lastly, the research identified that some adolescents are aware of the Tdap and HPV vaccine, but there still seems to be a significant knowledge gap between adolescents' males regarding the HPV vaccine. A larger population group with a more in-depth questionnaire would be needed to analyze further and explore these trends.

PHASE II: Development of educational campaign.

Once enough surveys were collected, the investigator analyzed the data to prepare an educational campaign that health care providers and educators can use when educating the adolescent population on the importance of vaccines. Focusing on health literacy of parents, providers, and educators was a key construct for the project. A pre- and post-test is useful in analyzing the statistical evidence retrieved from data of the educational campaign. This data can give the investigator an insight into the adolescent's established knowledge on vaccines. The data can also help strengthen the validity and generalizability of the study.

Phase II: Development and implementation of educational campaign:

With the use of the data collected from the surveys, an educational campaign was developed that can be used in delivering information to adolescents by health care providers and educators. The purpose was to develop a campaign that identifies the most effective ways to deliver information to adolescents in a way that will be both understood and retained. Data can be presented using resources such as PowerPoint presentations, demonstrations, and case studies. Special attention was paid to vaccines that are important to the adolescent population, which places them at high risk, including the HPV and meningococcal vaccine. Appendix B demonstrates an example of an educational campaign developed using the data gathered from the survey (Figure 27).

Discussion

Implications for practice:

Data analysis from the participant surveys demonstrated three common themes. Several goals were also established by the researcher to identify the most effective methods to educate the adolescents population. A majority of the adolescents who completed the survey understood that vaccines are important for the general population including young children and adults. Similarly, when it comes to risk, which is a big influential factor for the adolescent population, many understood that their population group is still at high risk of acquiring infectious diseases in the near-present or in the future, which included HPV and meningococcal diseases.

A common theme within most of the participants was the lack of education on the individual vaccines that adolescents receive through ages 11 through 18. Many adolescents reported having a good understanding of how vaccines work but scored poorly on questions regarding the knowledge and purpose of individual vaccines, specifically the HPV and meningococcal vaccines.

A second theme was the fear of side effects from vaccines and possible long-term health consequences. Many of the participants reported that they were concerned of the side effects from vaccines and mentioned it various times as a big denominator in the decision-making process. A majority of the participants reported that they base the decision-making process on their own health-conscious decision, indicating that adolescents would want to be included in the management of their care. Other factors in the decision-making process included opinions from their parents, providers, as well as school mandates for vaccination.

Data from the surveys showed that education and awareness is important for the specific age group, and it is of great significance when developing educational material for adolescents.

The specific age group relies on strong evidenced based data when considering health-based decisions as well as recommendations from their parents and providers. When educating adolescent, it is of great important to discuss side effects and health consequences with the use of statistical data. Recommendations to providers from the participants include educational discussions with the provider during the primary care visit as well as hosting educational sessions during or after school, where the age group can learn about vaccines specific to their age group. Figure 28 Represents a framework developed following the thematic breakdown from the data analysis.

Phase II of the project was focused on transferring the data from the surveys to create educational material for the specific age group using information that was gathered from the data results. Educational material can be transferred into the use of many multimedia platforms such as PowerPoint presentations, posters, and pamphlets. Specific areas of vulnerabilities were identified within the factual understanding of individual vaccines. A pre- and post-test was developed with the use of the information that was gathered from the survey results to address areas of weaknesses. This test can be used in further research to test the efficacy of the educational material.

Delivering data in a way that is significant to the age group is important as well as timing in the delivery of information. Educational material should be provided to all adolescents who present to their primary care providers and require vaccines. Evidenced based material based on the success of vaccines, efficacy and safety is key. Time provided to learn about the vaccines adolescents will receive is also important, this helps the adolescent prepare any questions they may have for the provider. One way of doing so could be through the development of universal pamphlets and posters for practices to be used in the waiting area.

Secondly, the data also shows that it would be crucial for providers to get involved with educators as well as the school-based system. As providers, part of the job is to advocate for our patients. Partnering with educators can be crucial in the development of the curriculum for high school students who make up a majority of vaccine recipients. Health care providers can collaborate with educators to change policies and influence change within the education curriculum to include more data not only on how vaccines work but vaccines that adolescents will receive through the crucial ages of 11 through 21.

The Center for Disease and Control has developed a framework that can be useful when considering the impact that the QI project can have on policy. To start, it is important to consider a few questions. One, for example, includes considering the impact that the project may have on public health if implemented. Through policy change and vaccine adherence one can hope that the vaccination rate within the adolescent population can improve. Furthermore, other elements such as feasibility, economic, and budgetary factors have to be considered. From a cost perspective, factors that which are important to consider with the project include both present and future cost-saving influences. In the present, simply changing school curriculum could be a cost-effective way to increase self- efficacy and reduce barriers within the adolescent population. From a cost-saving perspective, one can consider the fact that an increase in vaccination rate within the adolescent's population could lead to cost reduction within the health care industry in the long run.

An extensive literature review provided a great insight into previous successful research and common areas of weaknesses. Using the information gathered from the literature review, the investigator captured data from adolescents to fill in gaps within the evidence. For example, it was discovered that there is a lot of research dedicated to understanding parental hesitancy and

its influence on adolescent vaccine adherence, specifically related to the HPV vaccine. On the other hand, there is little information directed towards the attitudes and beliefs of the adolescent population and data focused on capturing knowledge directly on infectious diseases such as HPV and meningococcal disease.

Data from the survey provided beneficial information and a great insight into an adolescent's perception of vaccines, barriers to vaccination and common misconceptions, and areas of weaknesses. Influential factors such as fear of side effects and long-term consequences have not been previously established as a determinant in preventing poor vaccine adherence. Data from the survey recognized this as a common theme among most of the participants. Many adolescents report that they do not feel that they are given a chance to be educated on vaccines and have an open discussion with their provider or parents. Many are interested in learning and discussing options about their care. Data from the study can be influential in developing programs and influencing how health care providers directly provide information to their adolescent patients.

Limitations:

Some limitations were evident to the researcher when conducting the quality improvement project. Although the research yielded valuable data, a larger sample size would be beneficial in further studies. Larger sample sizes could benefit the statistical breakdown of the data and lead to the development of more significant research outcomes. Secondly, the surveys collected minimal sociodemographic information which included gender and age. Additional surveys with the use of supplementary sociodemographic information including ethnicity and race would be of great significance in the identification of barriers and weaknesses as well as the development of educational material for different ethnic groups. Failure to gather proper

sociodemographic data could be a big influencer in the generalizability of the study and the transfer of data to practice.

Lastly, bias was also a major influencer in the limitation of the study. Threats to the rigor of the study included biases and newfound opinions created by the COVID-19 pandemic and vaccines. Since the beginning of the COVID-19 pandemic, discussion of vaccines within the media and politics have influenced the way that many individuals see and think about vaccines, which could ultimately sway the way that participants base their decisions or opinions on vaccines, ultimately affecting the results of the survey responses.

Conclusions:

A comprehensive literature review demonstrated that there a significant decline in the number of adolescents who visit their primary care provider after the age of 16, leading to a decline in the number adolescents who are vaccinated for key vaccines including HPV and the meningococcal ACWY and B vaccines. Data from the survey demonstrated that although adolescents report an understanding of how vaccines work many do not know the difference between the vaccines, as well as the purpose of some of the critical vaccines that are given during the ages of 11-21. Using the Health Belief Model, it was identified that a big barrier within the specific age group is the fear of long-term consequences and side effects, as well as the influence that education and awareness have on the adolescent age group. Many adolescents self-reported in the surveys that they value simple explanations in and out of the clinic setting. Some adolescents self-reported the use of classrooms and educational settings as a beneficial way to influence adolescents in vaccine adherence. Lastly, the use of strong evidenced based data focused on the success of vaccines, efficacy and safety is of key importance when addressing the adolescent age group.

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Appendix A:

Figure 1.
Health Belief Model: Created with the use of LaMorte, W. W. (2019). The health belief model. Retrieved from https://sphweb.bumc.bu.edu/otlt/mph-modules/sb/behavioralchangetheories/behavioralchangetheories2.html

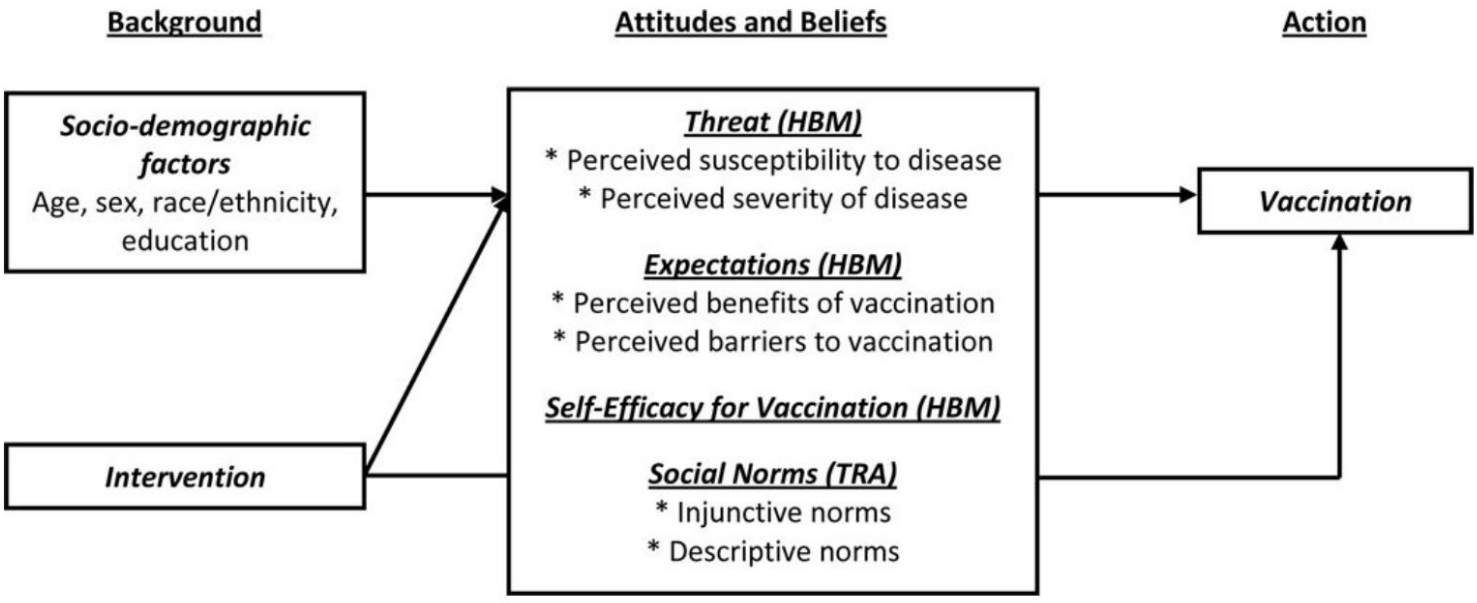
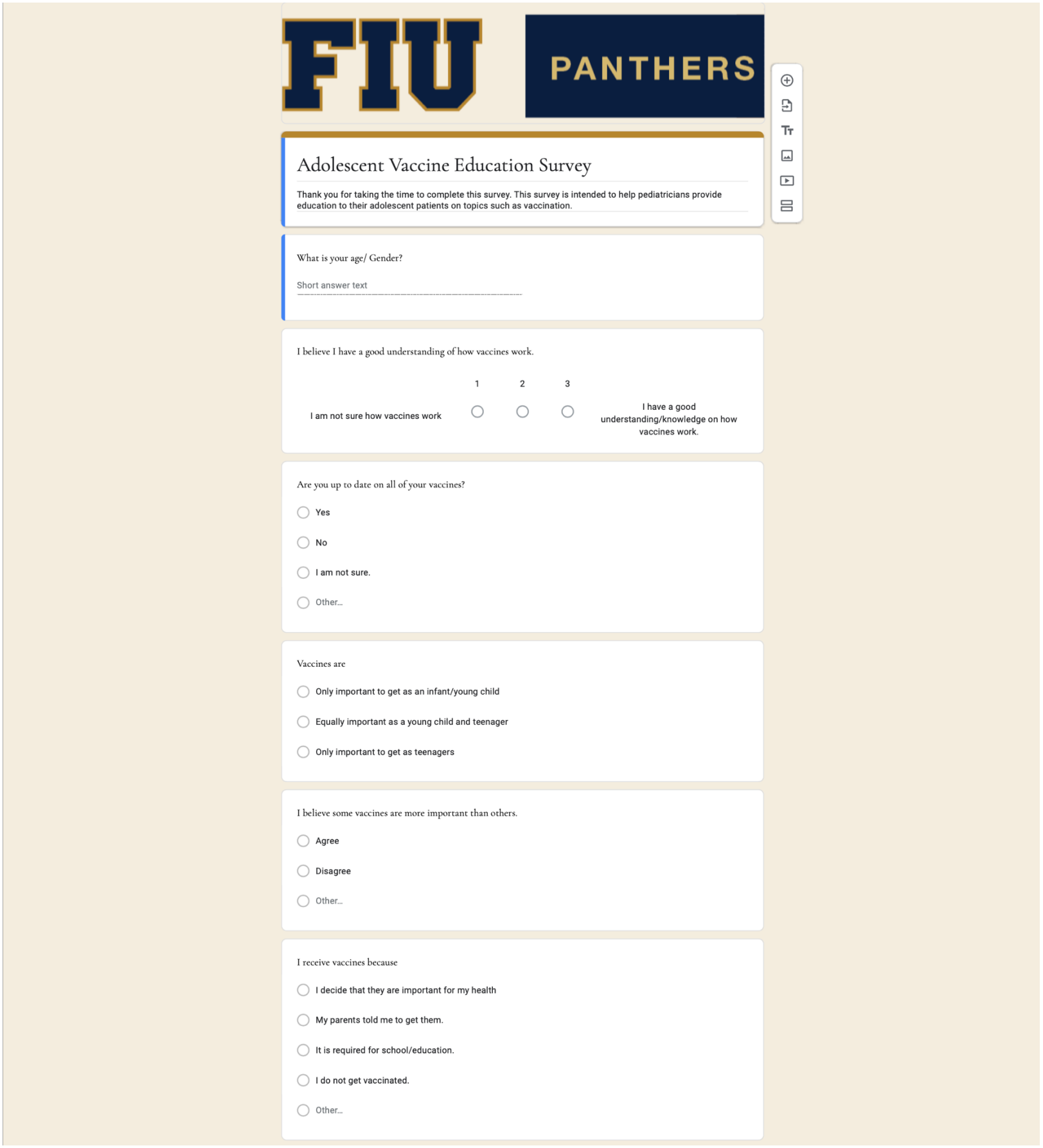


Figure 2.
Theoretical Framework developed by Gargano et al. (2014)

Figure 3.
Adolescent Vaccine Survey



There are vaccines that are important for teenagers to receive before going to college.

- ◯ Yes
- ◯ No

If I am young and healthy then infectious diseases won't affect me in the present or future.

- ◯ True
- ◯ False

The chances of catching an infectious disease (ex: HPV, meningococcal, pertussis) is low for those within my age group (Ages: 12-21)

- ◯ True
- ◯ False

Do you feel enough information is provided about the efficacy and safety of vaccines?

- ◯ Yes, enough information is provided by my healthcare providers
- ◯ No, there is not enough information provided by my health care providers

Are you concerned about the possibility of side effects from a vaccine. If so, would this deter you from receiving a vaccine?

- ◯ I am not concerned about side effects from vaccines.
- ◯ I am concerned but have been educated and still choose to be vaccinated.
- ◯ I am concerned and choose to not receive certain vaccines.
- ◯ Other...

I have heard about/Have some knowledge on the Meningococcal B vaccine.

- ◯ Yes, I have a good understanding of the purpose of the meningococcal B Vaccine
- ◯ I have a little knowledge on the meningococcal B Vaccine
- ◯ No, I do not know what the meningococcal B vaccine is for

I have heard about/Have some knowledge on the Meningococcal ACWY vaccine.

- ◯ Yes, I have a good understanding of the purpose of the meningococcal ACWY Vaccine
- ◯ I have a little knowledge on the meningococcal ACWY Vaccine
- ◯ No, I do not know what the meningococcal ACWY vaccine is for

I have heard about/Have some knowledge on the Tetanus, Diphtheria, Pertussis vaccine. (Tdap)

- ○ Yes, I have a good understanding of the purpose of the Tdap Vaccine
- ○ I have a little knowledge on the Tdap Vaccine
- ○ No, I do not know what the Tdap vaccine is for

I have heard about/have some knowledge on the HPV vaccine.

- ○ Yes, I have a good understanding of the purpose of the HPV vaccine
- ○ I have a little knowledge on the HPV vaccine
- ○ No, I do not know what the HPV vaccine is for

I feel like there has been more talk about pediatric vaccines in the media. (Not related to COVID-19)

- ○ Agree
- ○ Disagree

I feel like my pediatrician has provided sufficient information/education on vaccines.

- ○ Yes
- ○ No
- ○ Other...

Who do you trust the most for education in regards to important health choices such as vaccines.

- ○ My parents.
- ○ My pediatrician/primary care provider.
- ○ I make my own choices based on my own personal opinion.
- ○ The internet.

I make appointments to go see my pediatrician for annual check ups or only when I am sick.

- ○ I visit my pediatrician for my annual check up and sick visits.
- ○ I only see my pediatrician for sick visits.
- ○ Other...

What do you feel would influence or deter you from receiving a vaccine? Please be open and honest.

Long answer text

Do you have any recommendations to pediatricians in regards to vaccine education?

Long answer text

Figure 4.
Timeline for DNP project

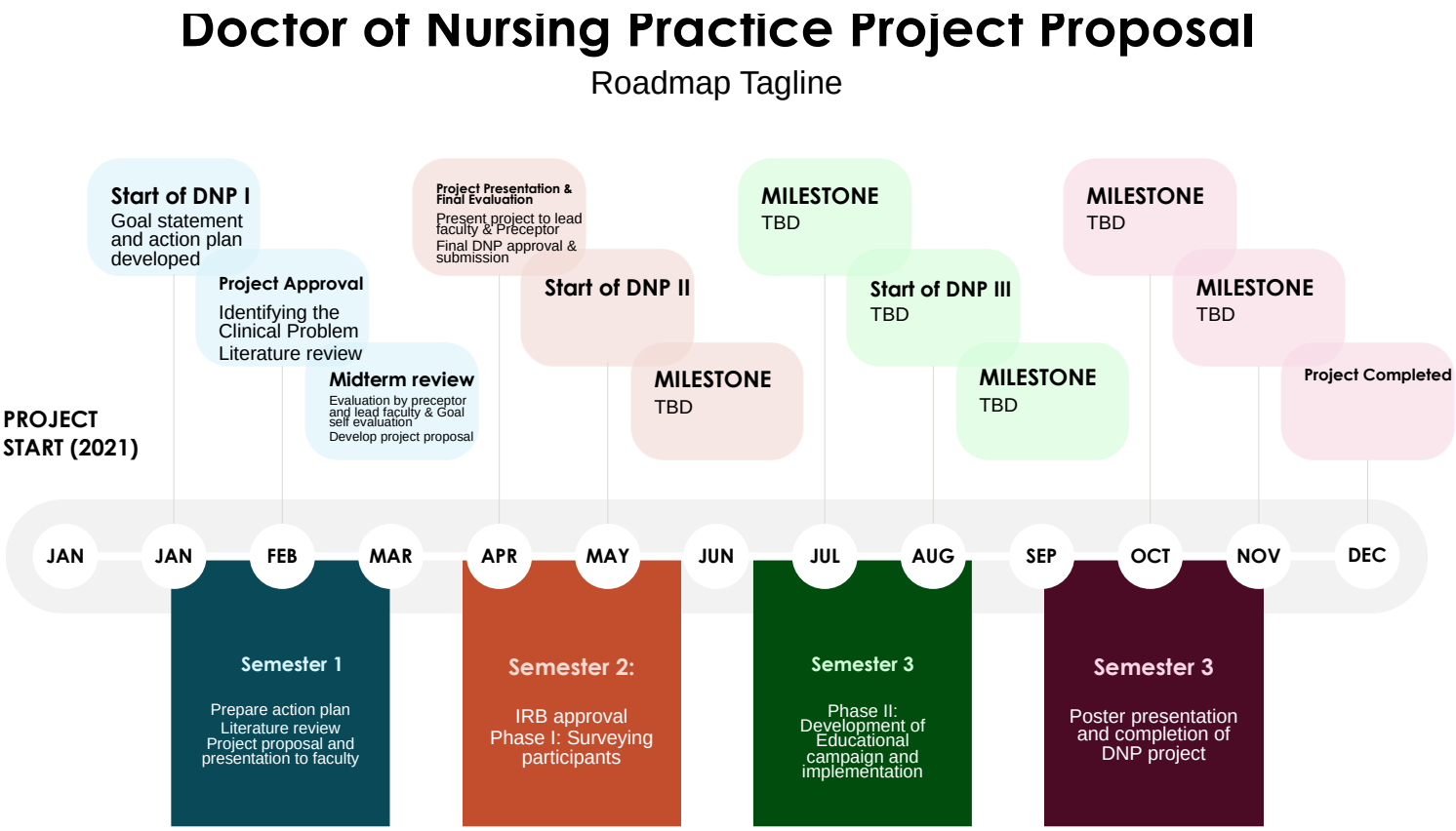


Figure. 5

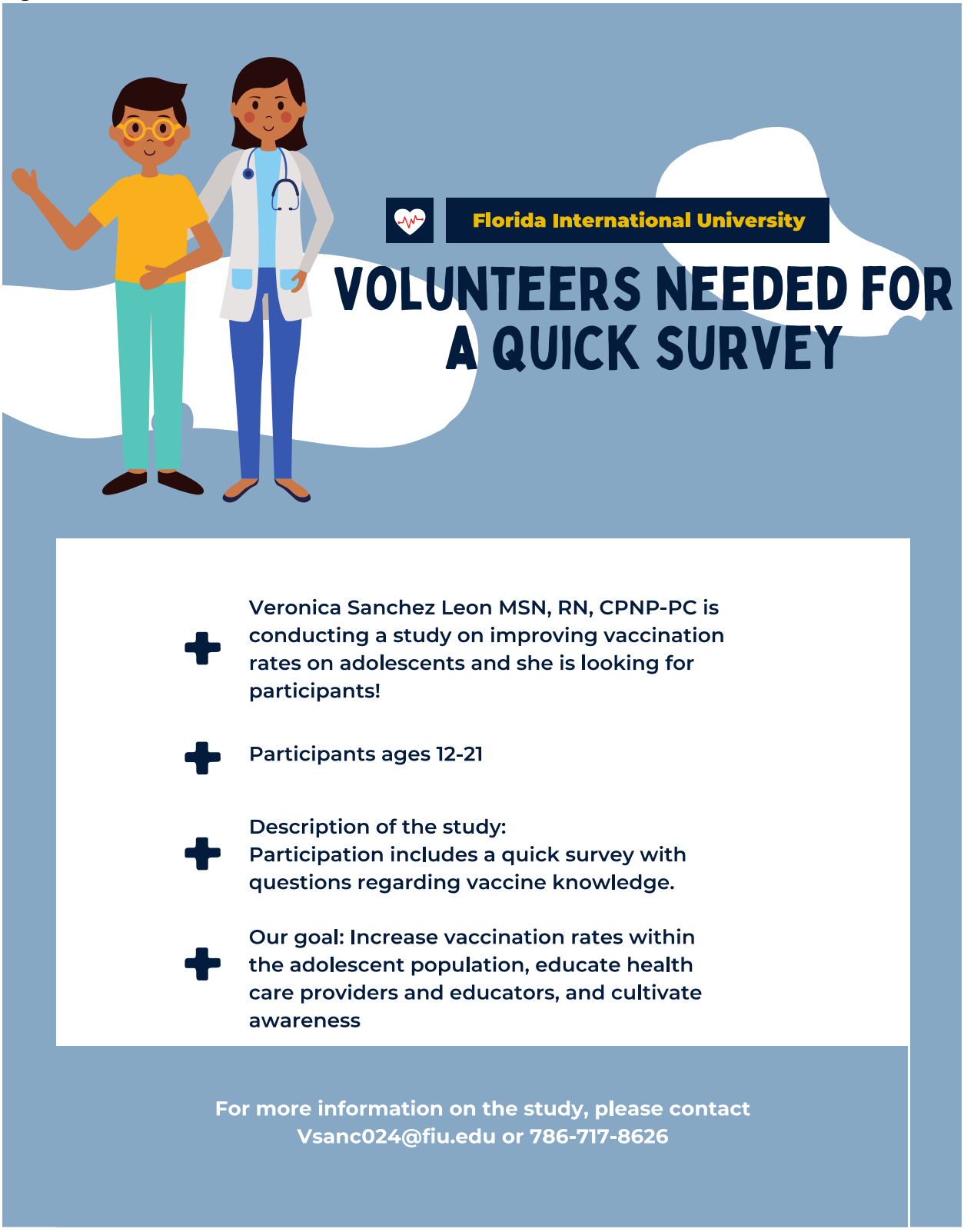

Florida International University
VOLUNTEERS NEEDED FOR A QUICK SURVEY
Veronica Sanchez Leon MSN, RN, CPNP-PC is conducting a study on improving vaccination rates on adolescents and she is looking for participants!
Participants ages 12-21
Description of the study:
Participation includes a quick survey with questions regarding vaccine knowledge.
Our goal: Increase vaccination rates within the adolescent population, educate health care providers and educators, and cultivate awareness
For more information on the study, please contact
Vsanc024@fiu.edu or 786-717-8626

Figure 7.
Parental consent form, child assent form, and adult consent form:

FIU IRB Approval:	07/13/2021
FIU IRB Expiration:	07/13/2024
FIU IRB Number:	IRB-21-0310

FIU | FLORIDA INTERNATIONAL UNIVERSITY

PARENTAL CONSENT TO PARTICIPATE IN A RESEARCH STUDY
Don't Forget: Teens need vaccines: A quality improvement project to improve vaccine uptake in the adolescent population.

SUMMARY INFORMATION
Things you should know about this study:

- **Purpose:** The purpose of the study is to improve vaccine uptake within the adolescent population.
- **Procedures**: If you choose to allow your child to participate, your child will be asked to fill out a quick survey.
- **Duration:** This will take about 15-20 minutes.
- **Risks**: The study does not pose any harm, risk or discomfort.
- **Benefits:** The main benefit to your child from this research is increase in knowledge and awareness on vaccines important to the adolescent population.
- **Alternatives:** There are no known alternatives available to your child other than not taking part in this study.
- **Participation:** Taking part in this research project is voluntary.

Please carefully read the entire document before agreeing to participate.

PURPOSE OF THE STUDY

The purpose of this study is to increase vaccination rates within the adolescent population, educate health care providers and educators, and cultivate awareness. The information collected from the study will be used to create an educational campaign that will focus on educating adolescents, health care providers, and educators on important vaccines within the adolescent population. By capturing the adolescents' attitudes and beliefs, the researcher will be able to format an educational session that is age-appropriate and allows for comprehension and retention of the information provided.

NUMBER OF STUDY PARTICIPANTS

If you agree to allow your child to participate in this study, he/she will be one of the 60 people in this research study.

DURATION OF THE STUDY

Your child's participation will involve 15-20 minutes.

FIU IRB Approval:	07/13/2021
FIU IRB Expiration:	07/13/2024
FIU IRB Number:	IRB-21-0310

PROCEDURES

If your child participates in this study, we will ask your child to do the following things:

1. Fill out a quick survey which asks questions about general vaccination knowledge, attitudes, and beliefs.

RISKS AND/OR DISCOMFORTS

This research study poses no risks, harms, or discomfort through participation including physical, psychological, social legal or economic.

BENEFITS

The study has the following possible benefits to your child: The anticipated knowledge gained from participating in the study can help increase awareness and knowledge within the adolescent population with an overall goal to increase vaccination knowledge, uptake, and adherence.

ALTERNATIVES

There are no known alternatives available to your child other than not taking part in this study Any significant new findings developed during the course of the research which may relate to your child's willingness to continue participation will be provided to you.

CONFIDENTIALITY

The records of this study will be kept private and will be protected to the fullest extent provided by law. In any sort of report we might publish, we will not include any information that will make it possible to identify your child. Research records will be stored securely and only the researcher team will have access to the records. However, your child's records may be inspected by authorized University or other agents who will also keep the information confidential.

If we learn about serious harm to you or someone else, we will take steps to protect the person endangered even if it requires telling the authorities without your permission. If we have reason to believe that your child is being abused, we will report this to the Florida Abuse hotline. In these instances, we would only disclose information to the extent necessary to prevent harm.

USE OF YOUR CHILD'S INFORMATION

The data collected in part of the study will be completely anonymous. The study will collect information regarding the patients age, not the birthdate. The participant pool will only include adolescent participants therefore a majority of participants will have the same age. Additionally, the survey will collect information regarding the knowledge on vaccines that are important to the adolescent population.

FIU IRB Approval:	07/13/2021
FIU IRB Expiration:	07/13/2024
FIU IRB Number:	IRB-21-0310

FIU | FLORIDA INTERNATIONAL UNIVERSITY

CHILD ASSENT TO PARTICIPATE IN A RESEARCH STUDY

Don't Forget: Teens need vaccines: A quality improvement project to improve vaccine uptake in the adolescent population.

WHY ARE YOU DOING THIS STUDY?

We would like for you to be in a research study we are doing. A research study is a way to learn information about something. We would like to find out more about your knowledge, attitudes, and beliefs about vaccines important to adolescents.

HOW MANY OTHERS WILL BE IN THIS STUDY?

If you agree to participate in this study, you will be one of 15-60 children in this research study.

WHAT WILL HAPPEN IN THIS STUDY?

If you participate in this study, we will ask you to do the following things:
Fill out a quick survey with questions about knowledge, attitudes, and beliefs regards to vaccines important to adolescents.

HOW LONG WILL THE STUDY LAST?

Your participation will require 15-20 minutes for the completion of the survey. Total length of participation within the study will take a maximum of one hour which includes obtaining consent from both the participants and legal guardian.

CAN ANYTHING BAD HAPPEN TO ME?

This research study has minimum risks such as social risks. Social risks, pertaining to personal attitudes on vaccines or health attitudes will be minimized by maintaining strict privacy of the results of the surveys. There are no physical, legal or economic risks involved.

CAN ANYTHING GOOD HAPPEN TO ME?

The following benefits may be associated with your participation in this study: The information provided will help develop teaching material that will be used to educate other adolescents, health care providers, and educators about vaccines important to adolescents.

FIU IRB Approval:	07/13/2021
FIU IRB Expiration:	07/13/2024
FIU IRB Number:	IRB-21-0310

COMPENSATION & COSTS

There is no compensation provided to the participant of the study. There are no costs to your child for participating in this study.

RIGHT TO DECLINE OR WITHDRAW

Your child's participation in this study is voluntary. Your child is free to participate in the study or withdraw his/her consent at any time during the study. Your child will not lose any benefits if he/she decides not to participate or if your child quits the study early. The investigator reserves the right to remove your child from the study without your consent at such time that he/she feels it is in the best interest.

RESEARCHER CONTACT INFORMATION

If you have any questions about the purpose, procedures, or any other issues relating to this research study you may contact Veronica Sanchez Leon at 786-717-8626, vsanc024@fiu.edu.

IRB CONTACT INFORMATION

If you would like to talk with someone about your child's rights of being a subject in this research study or about ethical issues with this research study, you may contact the FIU Office of Research Integrity by phone at 305-348-2494 or by email at ori@fiu.edu.

PARTICIPANT AGREEMENT

I have read the information in this consent form and agree to allow my child to participate in this study. I have had a chance to ask any questions I have about this study, and they have been answered for me. I understand that I will be given a copy of this form for my records.

_____ ___ _____
Signature of Parent/Guardian Date

_____ _____
Printed Name of Parent/ Guardian

_____ __
Printed Name of Child Participant

_____ _ _____
Signature of Person Obtaining Consent Date

ADULT CONSENT TO PARTICIPATE IN A RESEARCH STUDY

Don't Forget: Teens need vaccines: A quality improvement project to improve vaccine uptake in the adolescent population.

SUMMARY INFORMATION

Things you should know about this study:

Purpose: The purpose of the study is to improve vaccine uptake within the adolescent population

- **Procedures**: If you choose to participate, you will be asked to complete a brief survey.
- **Duration:** This will take about 15-20 minutes.
- **Risks**: This research study has minimum risks such as social risks. There are no physical, legal or economic risks involved.
- **Benefits:** The main benefit to you from this research is to increase knowledge and awareness on vaccines important to the adolescent population.
- **Alternatives:** There are no known alternatives available to you other than not taking part in this study.
- **Participation:** Taking part in this research project is voluntary.

Please carefully read the entire document before agreeing to participate.

PURPOSE

The purpose of this study is to increase vaccination rates within the adolescent population, educate health care providers and educators and cultivate awareness. The information collected from the study will be used to create an educational campaign that will focus on educating adolescents, health care providers, and educators on important vaccines within the adolescent population. By capturing the adolescents' attitudes and beliefs, the researcher will be able to format an educational session that is age-appropriate and allows for comprehension and retention of the information provided.

NUMBER OF STUDY PARTICIPANTS

If you decide to be in this study, you will be one of 15-60 people in this research study.

DURATION OF THE STUDY

Your participation will involve 15-20 minutes.

PROCEDURES

If you agree to be in the study, we will ask you to do the following things:
1. Fill out a quick survey which asks questions about general vaccination knowledge, attitudes, and beliefs.

RISKS AND/OR DISCOMFORTS

This research study has minimum risks such as social risks. Social risks, pertaining to personal attitudes on vaccines or health attitudes will be minimized by maintaining strict privacy of the results of the surveys. There are no physical, legal or economic risks involved.

BENEFITS

The following benefits may be associated with your participation in this study: The information provided will help develop teaching material that will be used to educate other adolescents, health care providers, and educators about vaccines important to adolescents.

ALTERNATIVES

There are no known alternatives available to you other than not taking part in this study.

CONFIDENTIALITY

The records of this study will be kept private and will be protected to the fullest extent provided by law. In any sort of report we might publish, we will not include any information that will make it possible to identify you. Research records will be stored securely, and only the researcher team will have access to the records. However, your records may be inspected by authorized University or other agents who will also keep the information confidential.

USE OF YOUR INFORMATION

The data collected in part of the study will be completely anonymous. The study will collect information regarding the patients age, not the birthdate. The participant pool will only include adolescent participants therefore a majority of participants will have the same age. Additionally, the survey will collect information regarding the knowledge on vaccines that are important to the adolescent population.

COMPENSATION & COSTS

There is no compensation provided to the participant of the study. There are no costs to your child for participating in this study.

RIGHT TO DECLINE OR WITHDRAW

Your participation in this study is voluntary. You are free to participate in the study or withdraw your consent at any time during the study. You will not lose any benefits if you decide not to participate or if you quit the study early. The investigator reserves the right to remove you without your consent at such time that he/she feels it is in the best interest.

RESEARCHER CONTACT INFORMATION

If you have any questions about the purpose, procedures, or any other issues relating to this research study you may contact Veronica Sanchez Leon at 786-717-8626, vsanc024@fiu.edu.

IRB CONTACT INFORMATION

If you would like to talk with someone about your rights of being a subject in this research study or about ethical issues with this research study, you may contact the FIU Office of Research Integrity by phone at 305-348-2494 or by email at ori@fiu.edu.

PARTICIPANT AGREEMENT

I have read the information in this consent form and agree to participate in this study. I have had a chance to ask any questions I have about this study, and they have been answered for me. I understand that I will be given a copy of this form for my records.

_____ _____

Signature of Participant Date

_____

Printed Name of Participant

_____ _____

Signature of Person Obtaining Consent Date

IRB Letter of approval:

FIU | FLORIDA INTERNATIONAL UNIVERSITY

Office of Research Integrity
Research Compliance, MARC 414

Veronica Sanchez Leon

July 16, 2021

"Don't Forget: Teens need vaccines. Improving vaccination uptake within the adolescent population: A quality improvement project"

The Institutional Review Board of Florida International University has your study for the use of human subjects via the process. Your study was found to be in compliance with this institution's Federal Wide Assurance (00000060).

IRB-21-0310 07/13/21

IRB Expiration Date: 07/13/24

As a requirement of IRB Approval you are required to:

Submit an IRB Amendment Form for all proposed

Receive annual review and re-approval of your study prior to your IRB expiration date. Submit the IRB Renewal Form at least 30 days in advance of the study's expiration date.
or discontinued.

HIPAA Privacy Rule:

Special Conditions: N/A

For further information, you may visit the IRB website at http://research.fiu.edu/irb.

Letter of support from facility/mentor:

South Florida Pediatric Partners

To Whom It May Concern,

My name is Belinda Godfrey, I am a pediatric nurse practitioner at South Florida Pediatric Partners. I'm writing to express my support for Veronica Sanchez Leon's Doctor of Nursing Practice project.

Veronica Sanchez Leon, who is a graduate nursing student at Florida International University, has proposed a project titled "Don't forget: Teens need vaccines: A quality improvement project to improve vaccine uptake in the adolescent population."

This project addresses an issue that is very important and influential towards the adolescent age group as well as practicing pediatric health care providers. Objectives and goals for the project include identifying barriers and misconceptions within the adolescent population as well as identifying the most effective methods to deliver evidenced based information to the adolescent population. Through the use of surveys, data will be collected that will be beneficial in the development and delivery of age-appropriate and evidenced based information to adolescents within multiple platforms.

Altogether, this project has the potential to improve the quality of care provided by health care providers and presents no risk to the productivity of the staff or the well-being of the patients and their families.

Thank you for your time.

Sincerely,

Mitigation plan:

Mitigation Plan for In-Person Human Research

Principal Investigator:	Rosa Roche/Veronica Sanchez Leon
Protocol Title:	Don't Forget: Teens need vaccines. Improving vaccination uptake within the adolescent population: A quality improvement project
IRB Approval #:	IRB-21-0310

Important: *Instructions are provided in italicized text. Please delete the italicized instructions from each section and replace with your own non-italicized text prior to submitting your mitigation plan.*

Summary and Goals of Research Project:

The proposed quality improvement project is to create an educational campaign that can be used in primary care clinics or delivered through educational facilities directly to the specific population such as high schools. Objectives for the project include identifying barriers and misconceptions within the adolescent population as well as identifying the most effective methods to deliver evidenced based information to the adolescent population. The proposed study will be conducted through two phases. The first phase will involve collecting data using surveys within the adolescent population. The data collected will initiate the second phase which will be the development of an educational session for adolescents. The method of data collection from the educational sessions will be through the use of pre-posttest. Data collected from the pre and posttest through learning sessions will then be used to develop an educational campaign that will be used to deliver age-appropriate and evidenced base information to adolescents in multiple settings through by healthcare providers and educators.

Human Subject Activities Requiring In-Person Interactions:

In-person interaction would include obtaining consents, surveys, and education sessions. It is important to note that the surveys can be conducted via electronic platforms such as google forms and survey monkey and the consents can be obtained electronically as well to prevent any harms or risks related to the covid-19 pandemic. Any educational material can be conducted through zoom or Microsoft teams.

Why the In-Person Activities Cannot be Conducted Remotely:

If required, consents and surveys can be obtained remotely via electronic platforms including google forms and survey monkey, as well as telephone and zoom.

Location(s) of the In-Person Activities:

Most of the recruitment will be conducted remotely using telephone and zoom. Should the need arise, in-person recruitment can also be completed at South Florida Pediatric Partners 11011 Sheridan Street Copper City, Fl 33026, with the support of Belinda Godfrey APRN

Participant Population and the Number of Participants:

The participants of the study will be adolescents ranging from ages 11-21. The Total expected number of participants will range from 15-60

Frequency and Duration for Each In-Person Activity:

In person interactions will consist of the consent and survey. Most of the personal interaction will include explaining goals and benefits of the project before obtaining consent. The participant will then be allowed to complete the survey without any interaction. Surveys will be completed one at a time to avoid overcrowding of participants in one area. The time explaining the consent/project will be brief and concise and the amount of time to complete the survey will be no more than 10-15 minutes

Scheduling and Screening Participants:

It is important to note that participants will be coming to the primary care center for individual services not pertaining to the research study. With permission of the health center and parents, the researcher will provide information to the parent and participant about the study. If both the participant and parent agree then consent and surveys will be obtained.

Personal Protective Equipment (PPE):

Participants and project staff will be wearing face coverings. Disposable face coverings will be given to participants who are not wearing masks.

Social Distancing:

Any in-person interaction will be conducted at a minimum of arm's length away from the participants. The participant can complete the survey on their own while the investigator maintains a distance minimum of six feet. Only one participant will be completing the survey at a time.

Personal Hygiene and Disinfecting Procedures:

Researchers will wash hands or use hand sanitizer in between any interaction with the participants. The researcher will use an EPA approved disinfectant to sanitize any equipment used example: pens in between each participant.

Collecting and Transporting Biospecimens:

Not applicable.

****

REQUIRED ATTACHMENTS (IF APPLICABLE)

☐ **1-Page Summary of Plan** (If your mitigation plan is longer than 2 pages in length)

☐ **COVID-19 Requirements from Each Clinical Facility** (if there are activities taking place off-campus)

208 N University Drive
Pembroke Pines, Fl 33024
Phone 954-432-3888 Fax 954-1165

Attention Colleagues,

RE: Veronica Sanchez, FIU ID# 3620378

It is my understanding you need a letter stating our COVID 19 precautions at South Florida Pediatric Partners. All our practices follow the current CDC guidelines, which includes is wearing masks, and social distancing. As this is a pediatric practice, we have always used universal precautions for all bodily fluids and handwashing is a standard of care. We also clean every room after each child visit regardless of illness. All COVID testing is done outside the practice for minimal exposure.

If you need any further information, please do not hesitate to contact me.

Respectfully yours,

Dr. Belinda A Godfrey, DNP, APRN, PPCNP-BC

South Florida Pediatric Partners

11011 Sh0eridan Street. Suite 311

Cooper City, FL 33026

954-435-7400

Appendix B: Graphs and Tables

Figure 13

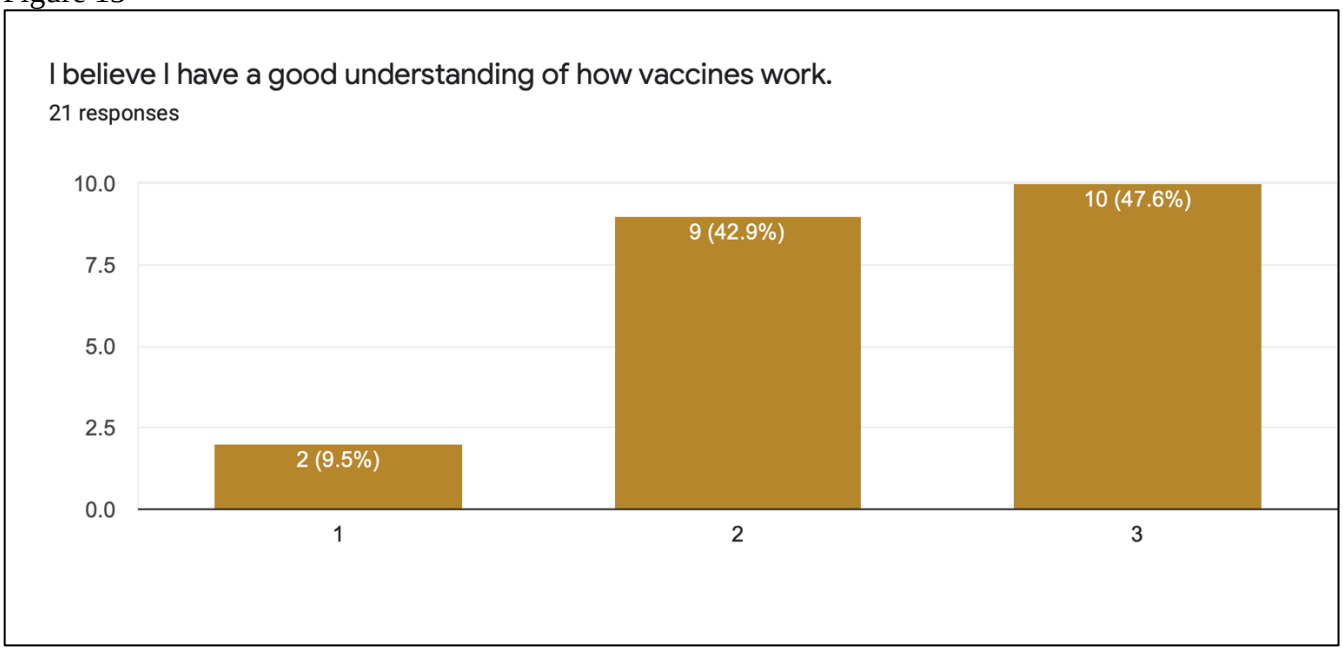


Figure 14

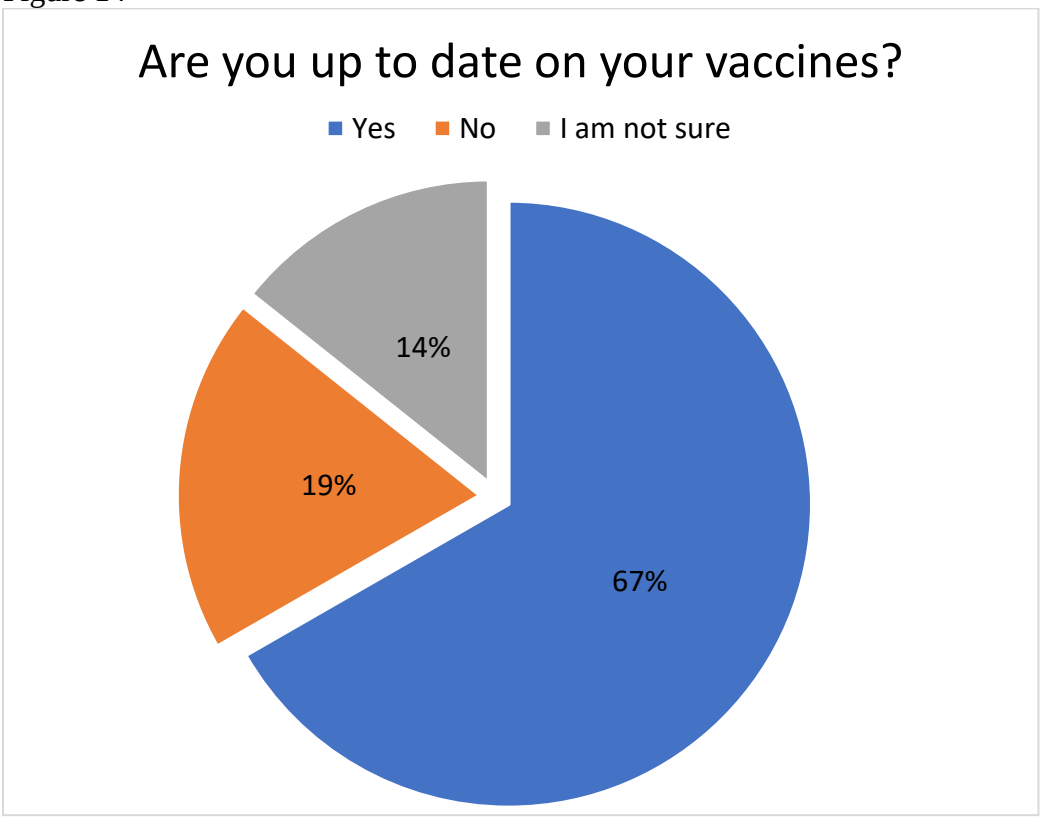


Figure. 15

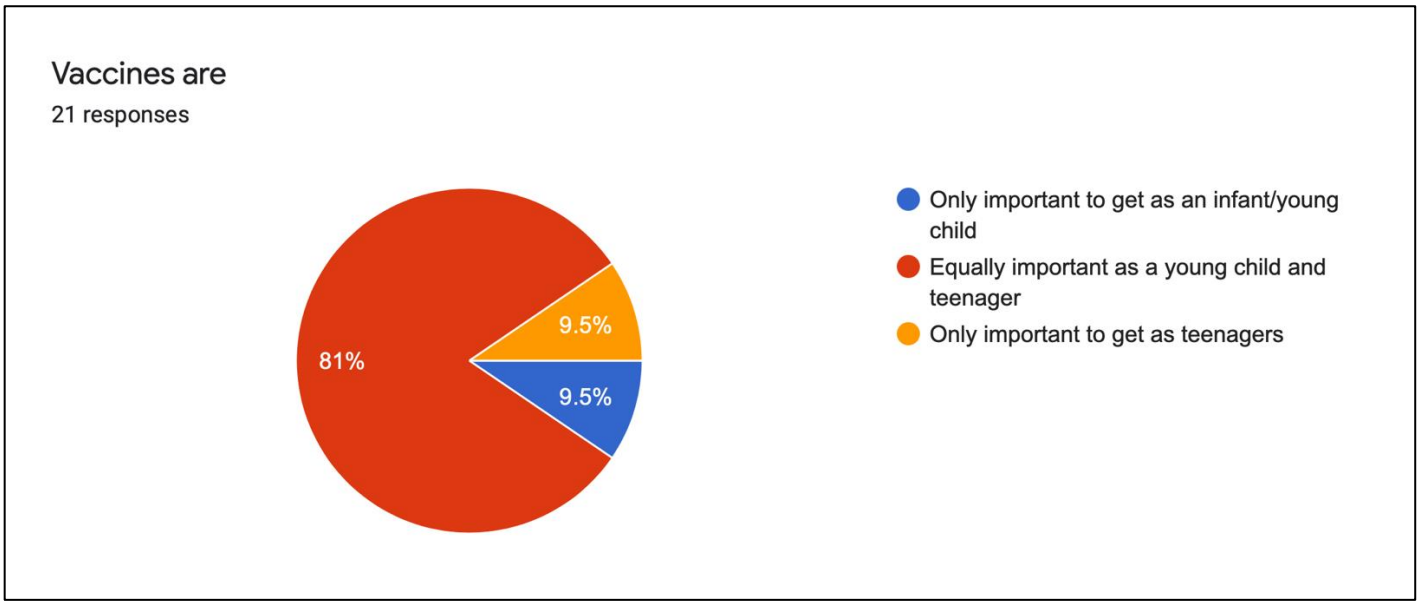


Figure 16

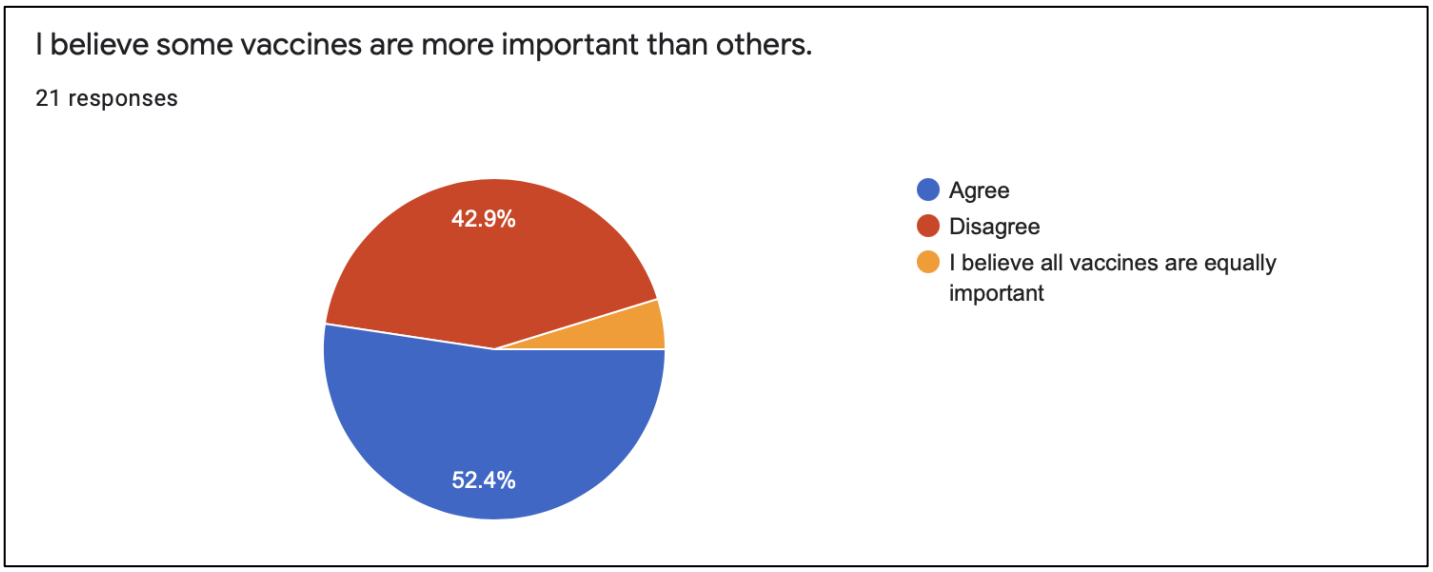


Figure 17

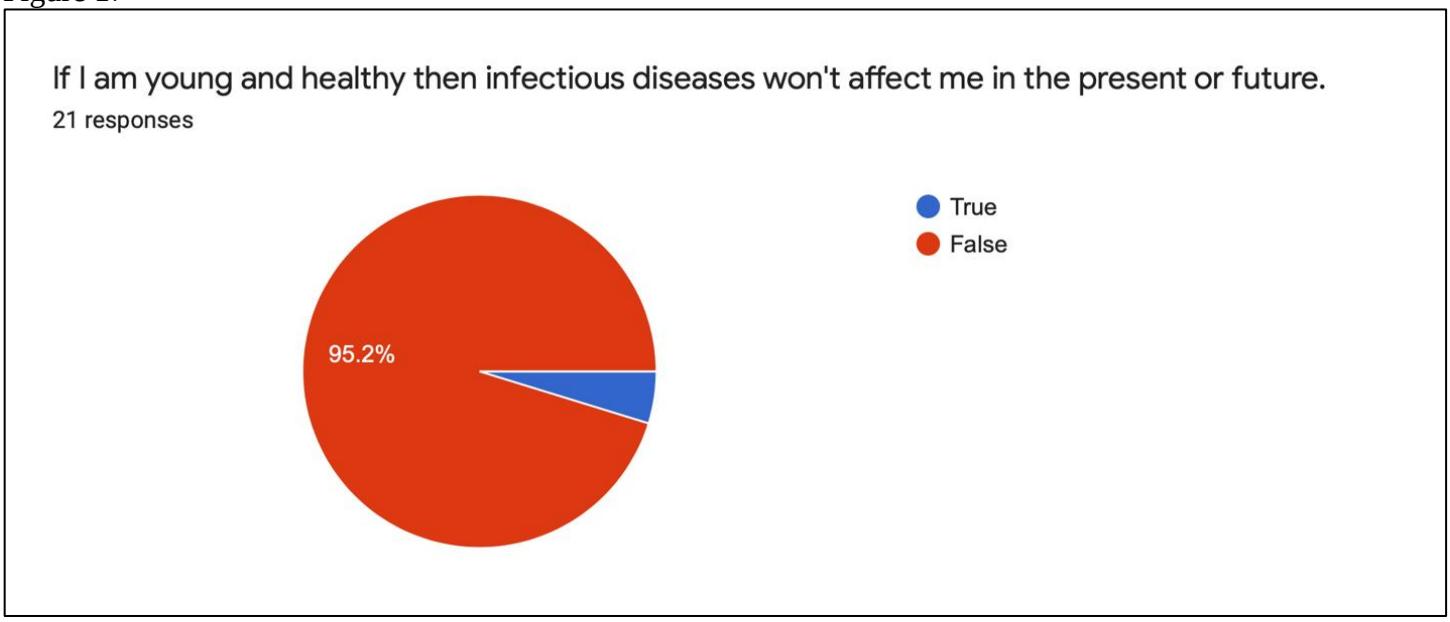


Figure 18

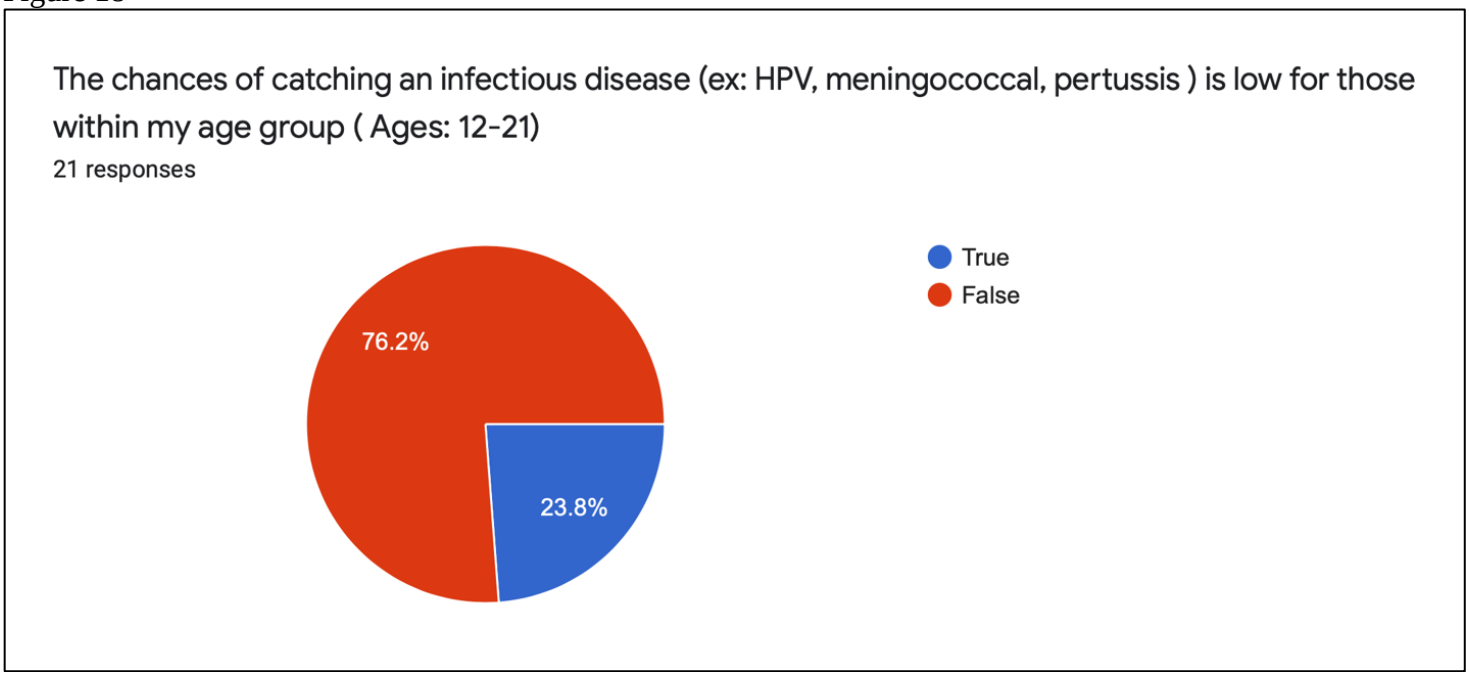


Figure 19: Perceived severity

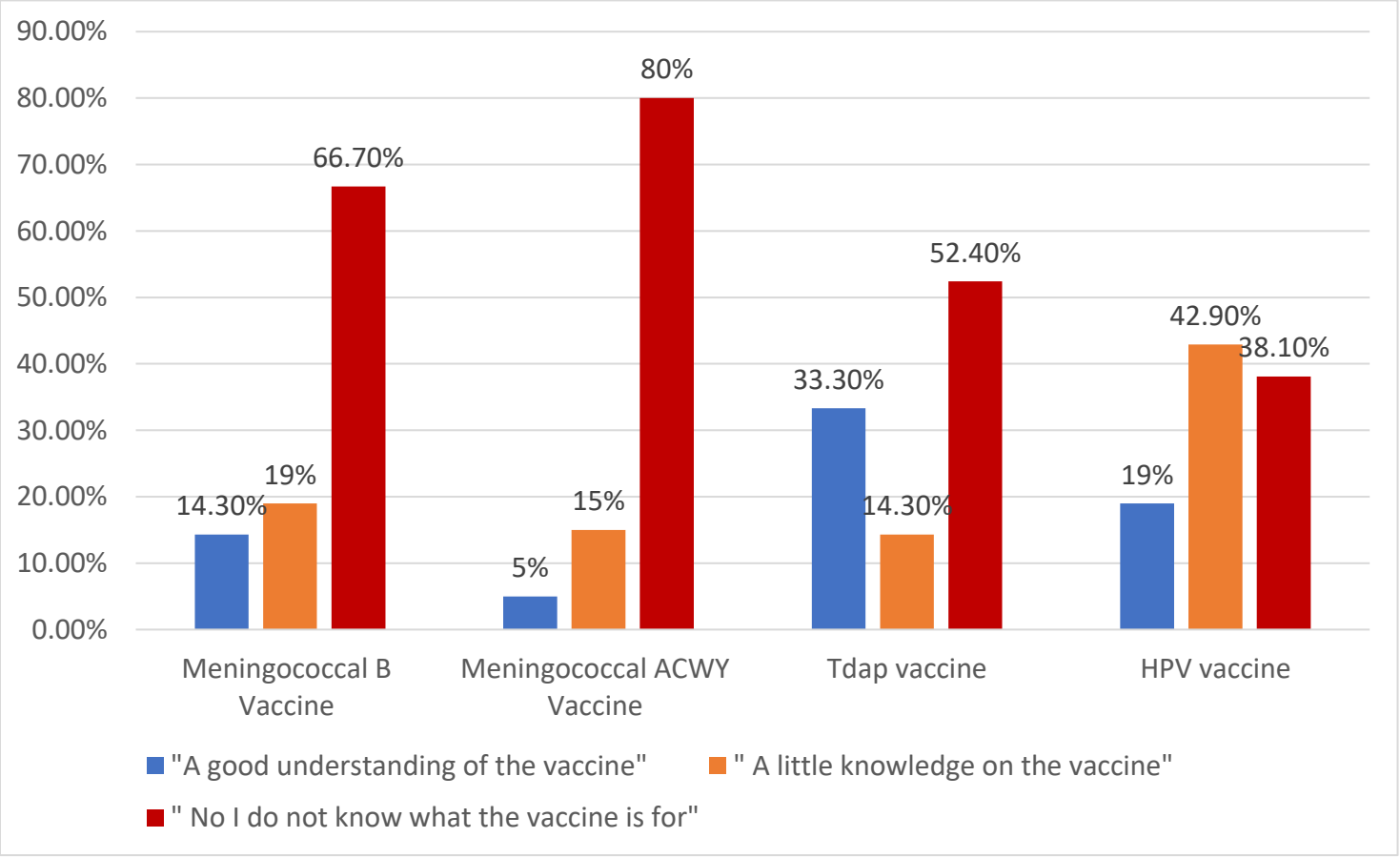


Figure 20

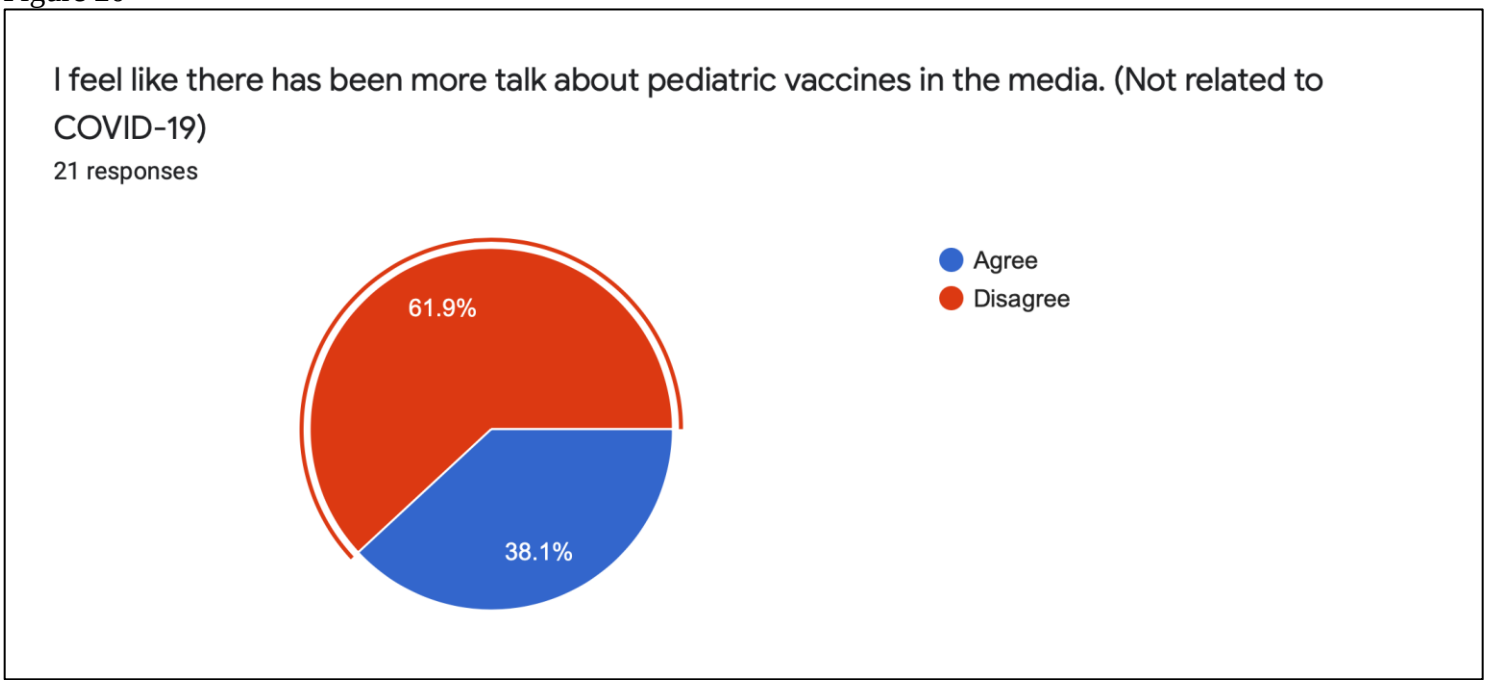


Figure 21

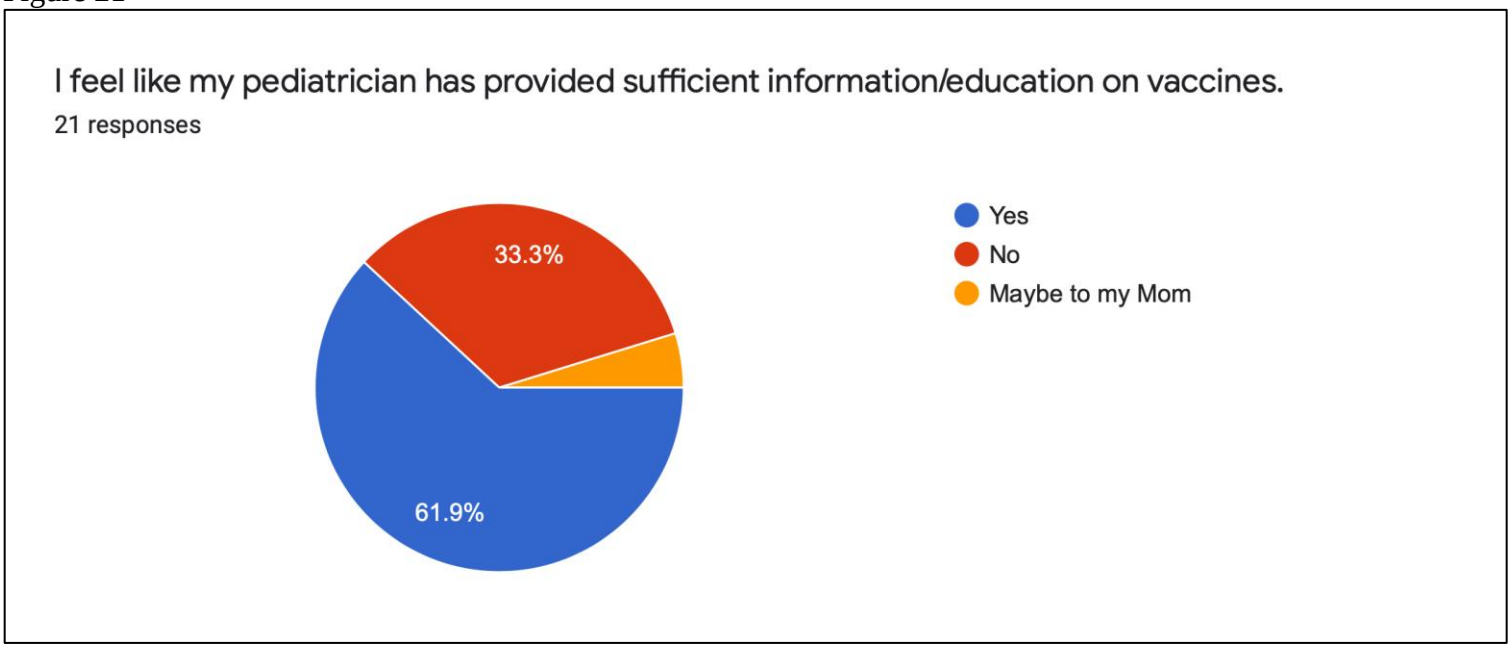
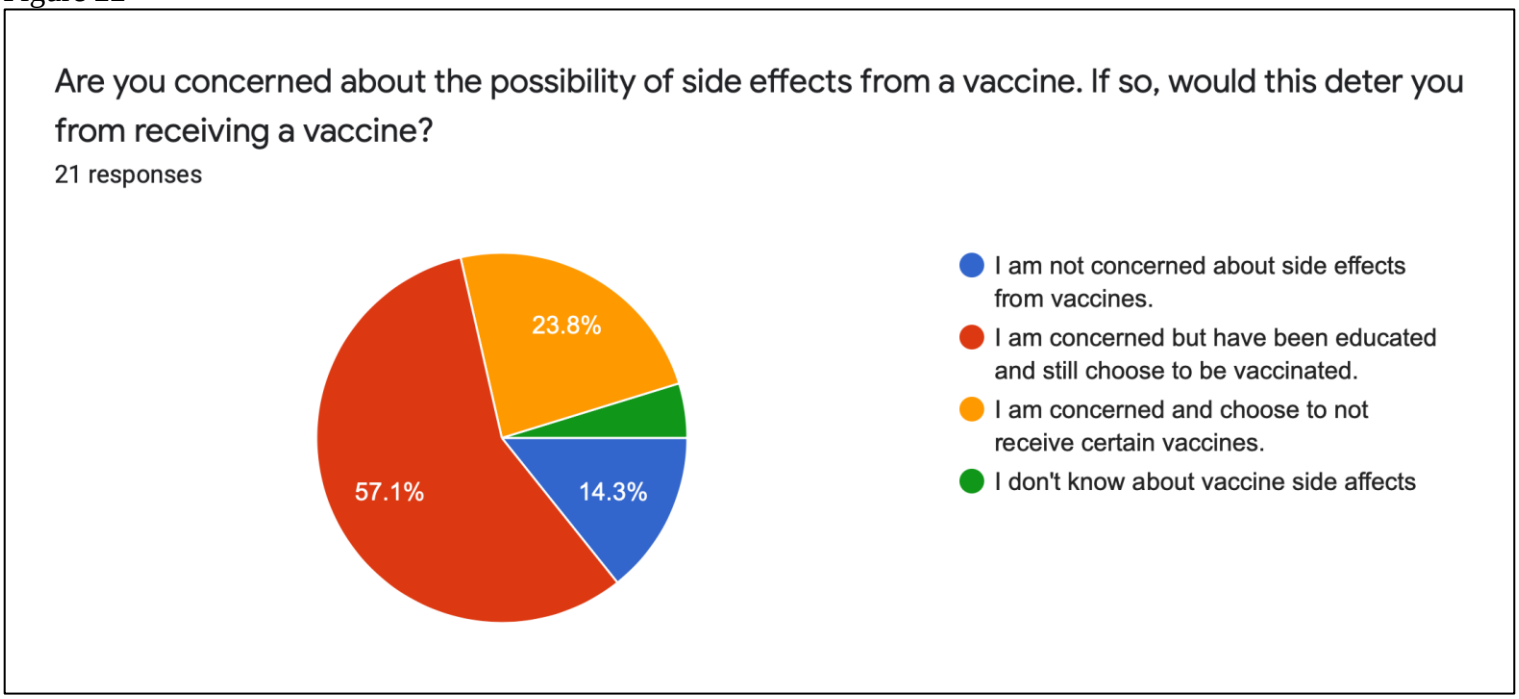


Figure 22



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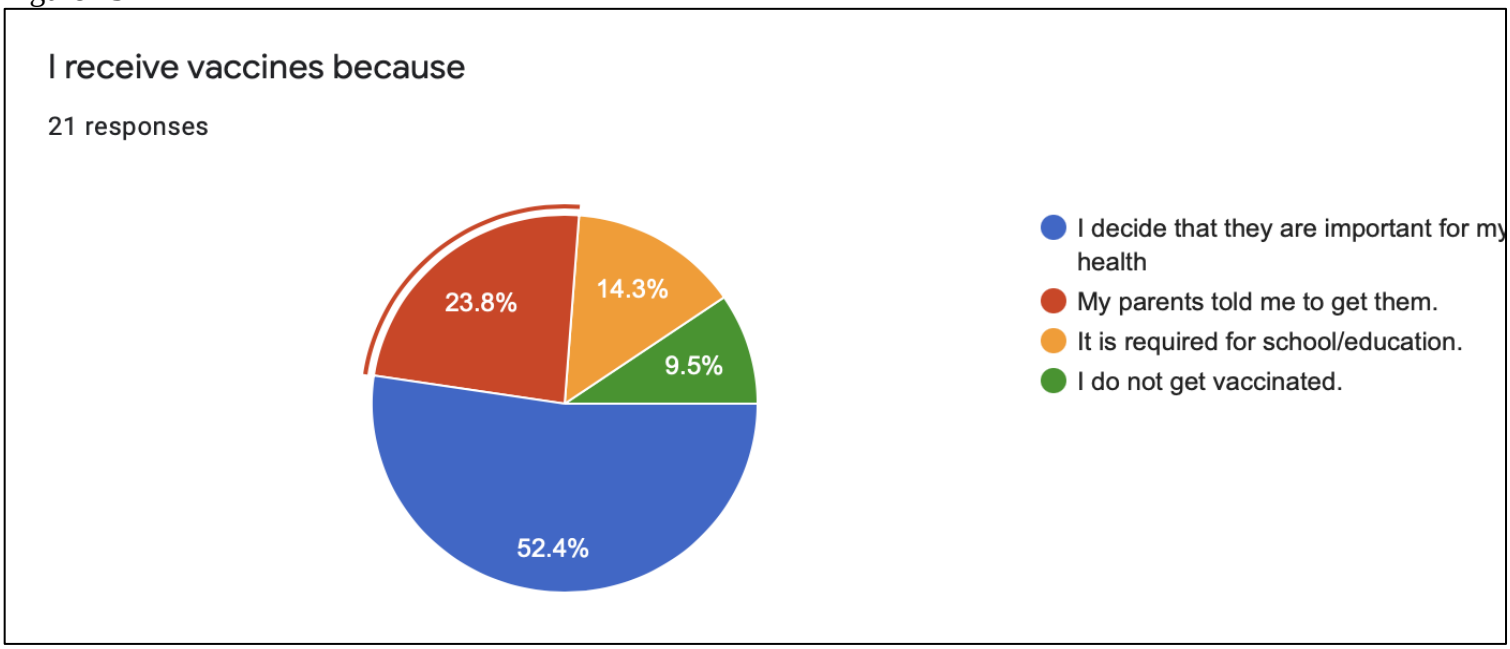


Figure 24

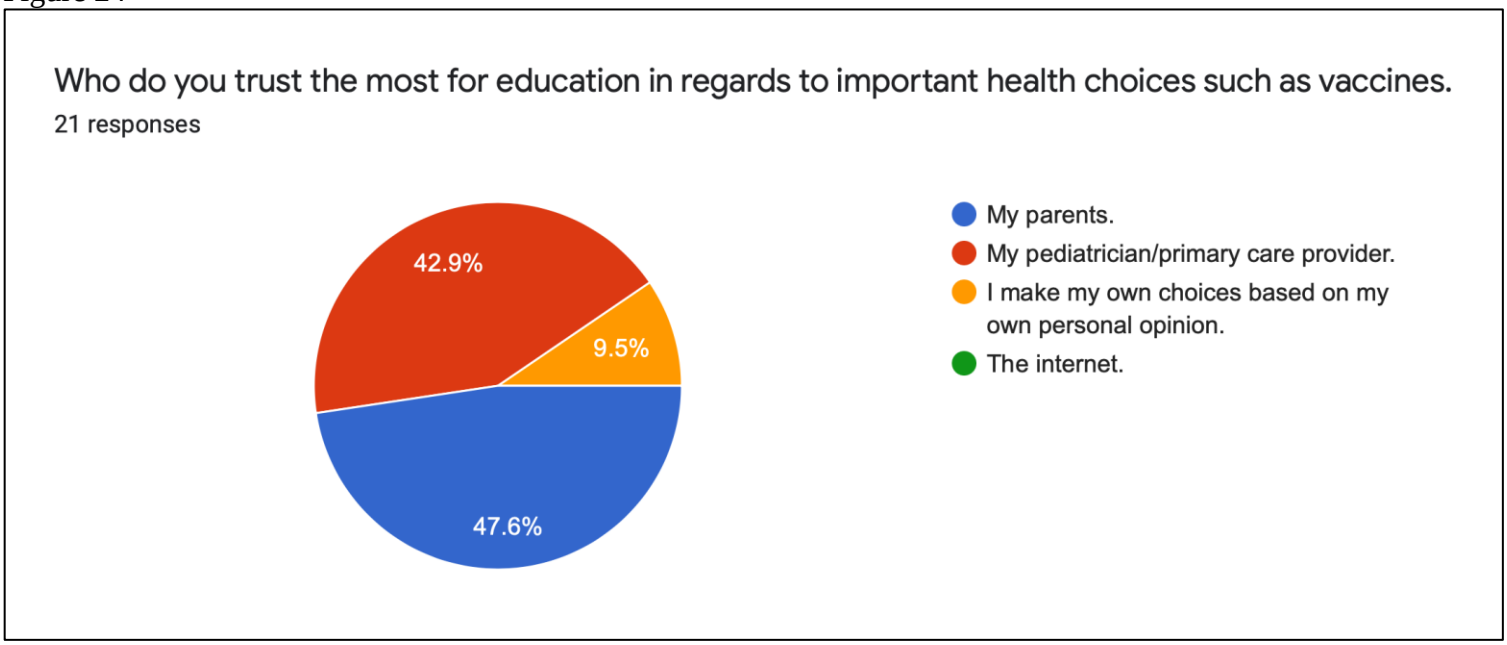


Figure 25

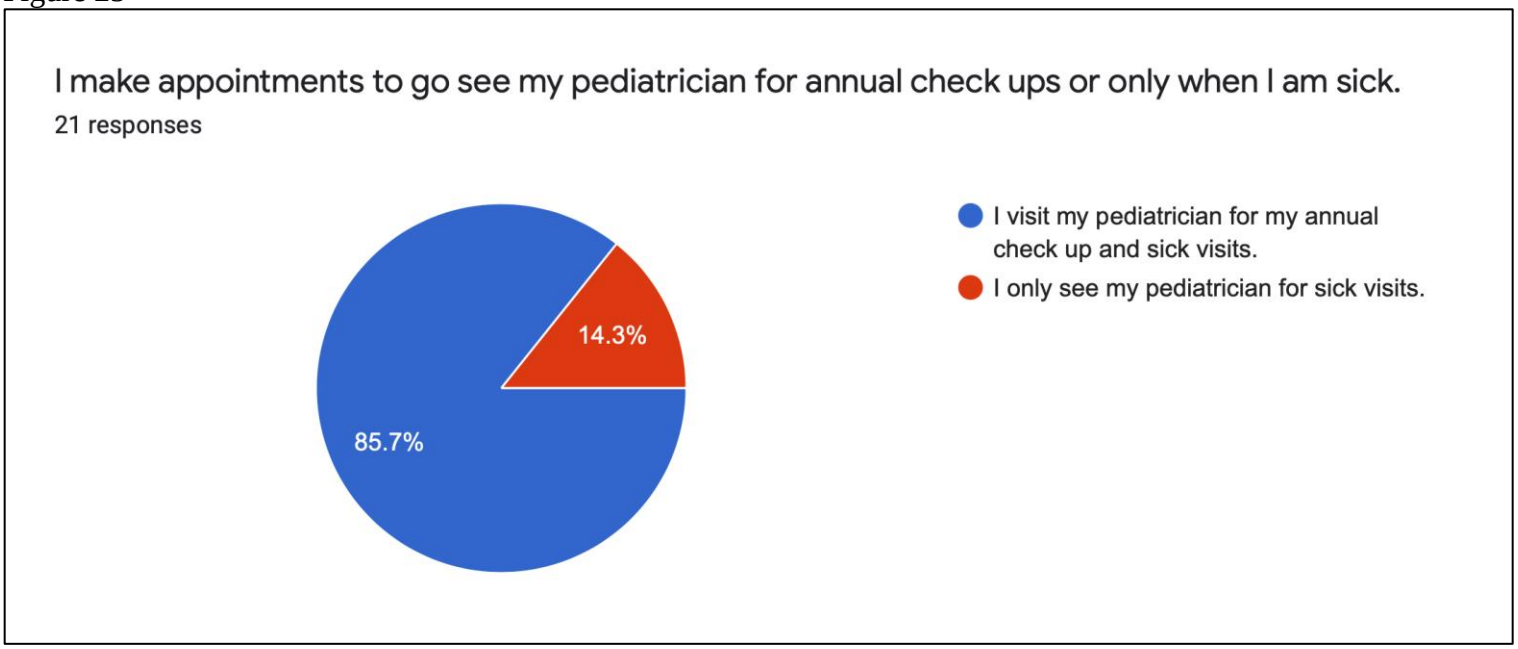


Figure 26:

What do you feel would influence or deter you from receiving a vaccine? Please be open and honest.
If there was a tremendous amount people having side effects.
Bad effects in the future or unknown effects
If one of the main side effects was death or something that lead me closer to death in the future
My mom
seeing that it isn't affecting anyone in a good manner
The side affects from the vaccine.
You can have many side effect, but if you are unvaccinated the risks of catching something much worse or likely higher. It's better to be safe than sorry.
I think that what would influence me would me receiving a concerning information form knowledgeable doctors and scientists.
My parents recommending the vaccine would convince me to get the vaccine
I feel if a vaccine had a certain side effect or has bad reviews I wouldn't get the vaccine.
When everyone has the vaccine and nothing happened.
The side effects
I can talk to my parents
To be honest, nothing would influence me to get the vaccine. Very afraid of the side affects and I know that sooner or later I'ma have to get it because of the career I'm pursuing.
To be honest, the only thing that would deter me from receiving a vaccine is if it is not approved by the government. I trust that they make the best, educated decision based on the information they have been given, and that
If there's not enough research or if the FDA hasn't approved.
I feel that the side effects of the vaccine would deter me from receiving a vaccine. I know that the vaccine are there to help me but sometimes I think there are some side effects that are a little concerning like as in having a fe
If not enough information and research has been done on it.
Scientific research
My nursing career
The only thing deterring me would be extreme symptoms and the effectiveness of the vaccine.
If the vaccine is not effective or does not do it's job to help people survive/prevent from any diseases/viruses.

Do you have any recommendations to pediatricians in regards to vaccine education?
Make a simple explanation.
Speak more about what the vaccine is FOR
Build trust with your patients, be thorough with explaining the pros and cons, don't give false/misleading information and if they choose not to get the vaccine don't invalidate there choice.
Explain more to the kids
they should inform you a good amount about the vaccine before asking if you would like to take it or not.
I recommend that pediatricians look into the education for the vaccine .
Approach kids and teenagers differently, I believe that is important to teach people in a way they feel touched or identified. Help them make their own choices regardless what the media or their parents think.
After giving me the vaccine they could educate me for around 5-10 minutes on what the vaccine does and how it's affective
Yes, they can explain a little bit more.
No I don't know nothing about it.
No
No I don't have any recommendations
No
I just think they should expand the education beyond their offices to the classroom. The majority of young people lack a basic understanding of the science behind any and all vaccines. We need to ensure that eventually ther
No.
I hope that pediatricians are educating their patients. If not I would recommend to have little sessions in which children are invited to come and learn about the purpose of a vaccine.
Colorful graphs
To help lower the stigma or fear towards getting vaccines.
Speak out more about the importance of vaccines. Make it more known so people can be educated about them.

Figure 27. Educational Campaign Presentation:

Think about these questions? true or false

- Severity of disease

1. Meningitis is spread through social contact- which can include sharing drinks or being in close contact
2. 1 out of every four adolescent/young adult can be an asymptomatic carrier of meningitis- meningitis leads to a bad headache and high fever
3. HPV vaccine prevents against future cancer
4. The lifelong consequences of meningitis are not really that significant
5. Only females are required to get the HPV vaccines
6. HPV is mostly known for its ability to cause genital warts

-

- Susceptibility of disease

1. If I am and young and healthy then a infectious disease will not really affect me
2. The chances of acquiring a preventable infectious diseases such as tetanus, pertussis, meningitis or HPV are low for those in my age group.
3. The chances of being affected by meningitis at my age group is low
4. If I am not attending college/dormitory, then the meningitis vaccines are not important for me to get
5. The chances of being affected by HPV at my age is low.
6. It is better to get the HPV vaccine as an adult instead of a teenager

The Who, What, When & Why of vaccines

- Who: The advisory committee of immunization practices (part of the CDC)
  - Include 15 experts within the medical field who are specifically appointed by the U.S Department of Health and Human Services
- What: The committee oversees and sets vaccine recommendations based on data and research
- When: The committee meets yearly and sets regulations and recommendations based on any new data that is presented
- Why: The ACIP focuses on the efficacy of the vaccine on various age groups, and determine who should get vaccines, and the long-term complications/risks of refusing vaccines

What are the ACIP recommendations for **adolescents**?

- Tdap
  - Age: 11-12
- Meningococcal ACWY Vaccine
  - Age 11-12 + booster at 16
- Human papilloma virus
  - Age 11-12 (2 dose series)
  - Age 15 (3 dose series)
- Meningococcal B vaccine
  - Ages 16-23
- Influenza
  - Annually

Center for Disease Control and Prevention vaccination coverage for 2019 in adolescents ranging 13-17

71.5% of adolescents have received one dose of the HPV vaccine
54% of adolescents are up to date on the HPV vaccine
88.9 % of adolescents have one dose Meningococcal ACWY
53.7% adolescents are up to date on the MenACWY 53.7%
Full coverage of the meningococcal B vaccine in adolescents is 21.8%
In 2019-2020 only 21% of those eligible received the FLU vaccine

School-mandated vaccines: ages 13-17

Tdap 90.2%

Greater than 90% for the

- Measles, Mumps, and Rubella
- Hepatitis B
- Varicella (Chicken pox)

What exactly are vaccine preventable diseases?

Tdap protects against:

- Tetanus,- exposed through cuts on skin- S/S stiff neck, abdominal muscles, muscle spasms, difficulty swallowing and fever
- Diphtheria and pertussis- respiratory complications, whooping cough, and sore throat with oropharyngeal grayish pseudomembranous

Meningococcal disease:

- fever, headache, stiff neck, neurological symptoms, dark purple rash – life threatening complications, seizures, strokes, deafness, developmental disorders, loss of limbs

HPV

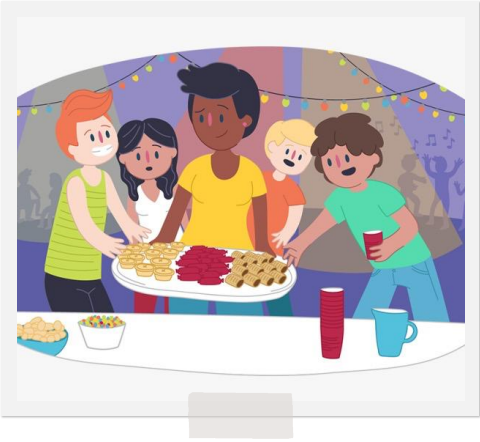
- Only vaccine that prevents against cervical, oropharyngeal, anogenital cancers and genital warts
- Spread through sexual contact

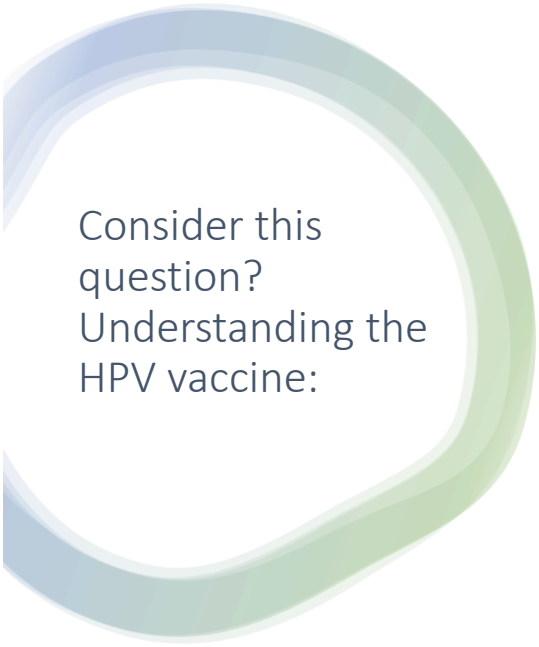
Are you planning on attending college?

- Going out of town
- Visiting friends who live in college dormitories
- Going to social events in college settings
- Playing sports in college
- Interested in music/theatre
- Want to have a successful career in medicine, law, art, science, tech?
- Preventable infectious diseases may lead to difficulties related to permanent disabilities ranging from problems with memory loss, concentration and coordination learning disabilities.

Meningococcal disease:

- Meningococcal disease in the adolescent population has been recognized as a public health issue.
- Why?
  - 1:4 adolescents can be asymptomatic carriers of the disease
  - Adolescents and young adults continue to be the highest carriers/transmitters of meningococcal disease
  - Method of transmission: close/social contact, droplet-sharing cups, kissing, etc..
  - Highest area of transmission: College/dormitories
  - Severity:
    - 90% of those infected do not make it past 24 hours of diagnosis (9.8% fatality rate)
    - 1:10 are likely to suffer lifelong complications including neuromuscular and developmental disabilities
    - 19% of those infected with the strain Neisseria meningitis will have some sort of permanent disability





- If you were given the chance to accept a token which granted you the opportunity to prevent disease in the future, would you take it?
  - Not only for yourself but for others as well
  - The token has been tested for 15 years – compared to other very popular tokens that are widely used
  - IF you accept the token at a later age – the efficacy rate goes down
  - Over 3 million people have used the token and have had successful results
    - Over 3 million have participated in clinical studies of the HPV vaccine
    - (Bednarczyk, 2019)

HPV disease:

- What is HPV
  - A viral disease with thousands of strains- some may lead to skin warts, genital warts, and different types of cancer
- It is the only vaccine that PREVENTS CANCER
  - *hpv related cancer
- The ACIP recommends that the vaccine be given starting at ages 11-12?
  - Why so young?
  - Consider the token question that was mentioned earlier.

- The HPV vaccine is given is recommended at ages 11-12 years of age because of the increase in risk-taking behaviors of adolescent and exposure.
- The HPV vaccine will
  - Not only protect yourself but others as well
  - Was created in 2006 and was recommended around the same time as the Tdap and Meningococcal vaccine.
  - The immune system reacts more effectively to the vaccine at a younger age which is why you only need a 2-dose series – compared to a 3-dose series after 15 years of age.
  - Over 3 million people have safely received the HPV vaccine.

- Tips to remember:
  - It is never too early to give the HPV vaccine. The earlier the better.
  - HPV does not only lead to cervical cancer
  - Males are at high risk as well – risks are for **BOTH** genders

Think about these questions? true or false

- Severity of disease

1. Meningitis is spread through social contact- which can include sharing drinks or being in close contact
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- Susceptibility of disease

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References:

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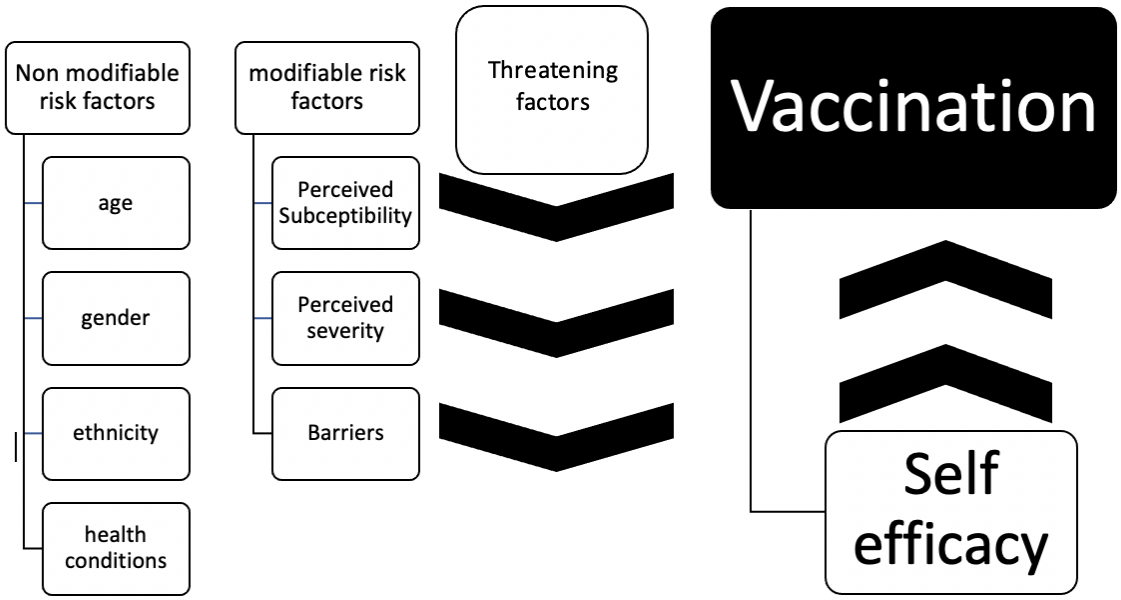
Figure 28.


Non modifiable risk factors
age
gender
ethnicity
health conditions
modifiable risk factors
Perceived Subceptibility
Perceived severity
Barriers
Threatening factors
Vaccination
Self efficacy