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Final Manuscript

Addressing Vaccine Hesitancy with Motivational Interviewing: A Pilot Study

Olivia Ball

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Abstract

Statement of the problem: The unprecedented 2019 Measles outbreaks in the US and the current COVID 19 global pandemic highlight the necessity of addressing vaccine hesitancy. Improving vaccine confidence requires strategic communication approaches that focus on addressing the complex reasons for vaccine hesitancy.

Purpose: The purpose of this project was to improve both provider's understanding of the complex factors involved in vaccine hesitancy and confidence in using motivational interviewing to address vaccine hesitancy.

Intervention: An educational presentation for advanced practice nurses was conducted with the purpose of highlighting the benefits of using motivational interviewing in vaccine hesitant patients.

Results: The presentation to nurse practitioners in San Diego led to improvement in ability to assess for vaccine hesitancy and improvement in knowledge of motivational interviewing.

Conclusions: This project shows that continued research into effective interventions is a necessary approach in confronting the complex challenges of vaccine hesitancy.

Addressing Vaccine Hesitancy with Motivational Interviewing: A Pilot Study

The World Health Organization (WHO) estimates that vaccinations prevent 2-3 million deaths a year globally (2019). By 1998, the infectious diseases of smallpox, diphtheria, poliomyelitis, and measles were 100% eradicated (CDC, 1999). However, an increasing cultural lack of confidence in vaccines has led to reversals in eradications. The 2019 measles outbreaks in the US underscore this trend as cases rose to levels not seen since 1992 (CDC, 2020). Then in 2020, the COVID-19 global pandemic and the later development of multiple SARS-CoV-2 vaccines have hastened the need for innovative approaches towards vaccine hesitancy and adherence. This project aims to present effective approaches to address vaccine hesitancy and adherence through practice and policy change.

Problem Description

The Strategic Advisory Group of Experts on Immunization (SAGE) defines vaccine hesitancy as a “delay in acceptance or refusal of vaccines despite availability of vaccine services... [and] is complex and context specific, varying across time, space, and vaccines... influenced by factors such as complacency, convenience, and confidence” (WHO, 2014, p. 7). Not to be confused with the “anti-vax” movement where there is a complete loss of confidence in vaccines, the term vaccine hesitancy suggests the possibility for change in confidence. The US 2020 National Vaccine Plan Development named 5 goals to improve vaccination adherence with their 3rd goal to “enhance knowledge of and confidence in routine vaccines and the immunization system... [by researching] effective communication strategies to... address vaccine hesitancy” (p. 185).

Background

The complex factors that influence vaccine hesitancy must be understood for the problem to be fully addressed. Two taxonomies are currently prevalent to describe these factors. Betsch et al. (2018) developed the 5C psychological antecedents of vaccination which includes categories of confidence, complacency, constraints, calculation, and collective responsibility. SAGE developed a similar system called the 5As taxonomy for the determinants of vaccine uptake that includes categories of access, affordability, awareness, acceptance, and activation (Thomson, et al., 2016). In both of these taxonomies, the individual categories are used to guide clinicians to determine reasons a person chooses or declines vaccines, which leads to appropriate interventions.

Although these taxonomies aim to capture a broad scope of reasons for vaccine hesitancy, understanding cultural and societal influences at an individual level is necessary. Sobo (2016) takes an anthropological approach to understanding vaccine hesitancy, theorizing that the social and power structures that people live in can influence vaccine behavior. This view highlighted a trend found in an affluent school system where a small but powerful network of parents influenced other parents to not vaccinate. From this perspective, “vaccine refusal often serves as a declaration of identification with the social setting of import to the individual” (Sobo, 2016, p.345). Although this approach intrinsically is complex and not predictable, a cultural approach is necessary to fully understand the factors that influence vaccine hesitancy.

Rationale

To address individual and cultural beliefs that contribute to vaccine hesitancy, evidence points to interventions performed on an individual basis that incorporate structured education. The strongest evidence from a 2018 systematic review found that face to face information and education to parents improved childhood vaccination rates (Kaufman, et al.). One RCT studying

HPV vaccine behavior across 16 public and private practices with n=43,132 found that a structured educational intervention to parents using motivational interviewing (MI) improved vaccinations and improved provider's confidence in communicating with parents (Dempsey, et al., 2018; Reno, et al., 2018). Another RCT (Gagneur, et al., 2018), used the "PromoVac" program (using MI techniques) on a maternity unit and improved vaccine intention and decreased hesitancy. A 2019 qualitative study showed that when providers had increased training in MI, influenza vaccination rates improved (Wermers, et al., 2020). This evidence shows that MI can be an effective approach to addressing vaccine hesitancy.

Prior to developing and implementing an intervention, a cost-benefit analysis was performed. Systemic costs include declines in herd immunity and increases in preventable infectious disease which strain the healthcare system. Practical costs include a one-hour educational session given to APRNs with average NP hourly wage of \$59. When considering benefits for an intervention, the WHO (2020) estimates that for every \$1 invested in immunizations, there is a \$44 savings in healthcare costs, lost wages and productivity. This analysis justifies implementing an intervention aimed at addressing vaccine hesitancy.

Specific Aims

Motivational interviewing is a therapeutic communication approach that uses specific types of questions and responses to guide patients to identify their own values that drive motivation for action or change (Levounis, et al., 2017). Using this evidence, a plan to develop an educational presentation to advanced practice nurses how to use MI with vaccine hesitant patients. The purpose of this project was to improve both provider's understanding of the complex factors involved in vaccine hesitancy and confidence in using motivational interviewing to address vaccine hesitancy.

Methods

Context

The setting for this evidence-based project was a local chapter of a state nurse practitioner professional organization. The nursing organization offers resources including conferences and educational courses to its members. In November 2020, local members were invited to attend a one-hour session of vaccine hesitancy and MI education. Information was presented in a webinar style online format.

Interventions

The Iowa model of evidence-based practice was chosen to guide the process of this project. Although the Iowa model has been used most often in clinical settings, the step-by-step process with feedback loops aided in identifying the problem for this project, collaborating and forming a team with various disciplines, designing the presentation, and evaluating the results.

Problem identification in April-June 2020 began with collaboration with advisers. During this time, a review of literature and synthesis of evidence led to the development of the presentation from July-September. In September, collaboration with the local vice president of the nursing organization resulted in securing a date for the presentation. In October, local members of the nursing organization were invited to attend a continuing education session to review vaccine hesitancy and learn basic concepts of MI. Table 1 provides an outline of the content of the educational presentation using the work of Levounis et al. (2017) to teach MI.

Measures

Attendees of the educational session were invited to participate in pre-session and post-session surveys. The pre-session survey measured attendee's confidence in knowledge and skill with both vaccine hesitancy and motivational interviewing and attendee's likelihood that they

would encounter vaccine hesitancy in their work environment. The post-session survey measured attendees' likelihood to use motivational interviewing with vaccine hesitant patients, whether or not the session improved the attendees' abilities to assess for vaccine hesitancy, and whether or not the attendees' knowledge of motivational interviewing improved. Responses for all survey questions were formatted using 5-point Likert scales for confidence, likelihood, and agreement respectively. Survey Monkey (2020) was used to collect and display data gathered.

Results

A total of 5 attendees completed the pre- and post-session surveys. Pre-session survey questions asked participants to rate their knowledge and skills in assessing vaccine hesitancy, to rate their knowledge and skills in using motivational interviewing, and to rate the likelihood they would encounter vaccine hesitancy in their practice. Participants rated knowledge and skills in assessing vaccine hesitancy with 40% very confident, 20% somewhat confident, 20% not so confident, and 20% not at all confident (see Figure 1). For knowledge and skills in using motivational interviewing, results were 40% very confident, and 60% somewhat confident (see Figure 2). For participants likely to encounter vaccine hesitancy, results were 20% very likely, 40% likely, 20% unlikely, 20% very unlikely.

Post-session survey questions asked participants to rate their improvement in ability to assess for vaccine hesitancy, to rate improvement in understanding motivational interviewing, and to rate the likelihood of using motivational interviewing to address vaccine hesitancy. Participants rated improvements in assessing vaccine hesitancy with 60% strongly agreed and 40% agreed. For improvements in understanding of motivational interviewing, Figure 3 shows 80% strongly agreed and 20% neither agreed nor disagreed. Participants' likelihood to use

motivational interviewing for vaccine hesitancy responses is shown in Figure 4 with 80% very likely and 20% likely.

Discussion

Interpretation

Vaccination providers can benefit from increased training in vaccine hesitancy and MI. A brief educational session on MI can help providers gain confidence in how to approach vaccine hesitancy with patients. Professional nursing organizations are a viable forum to offer continuing educational sessions focused on addressing vaccine hesitancy with MI for providers.

Limitations

This project had several limitations. First, the number of attendees was 5. Attendance could have been influenced by so-called ‘zoom fatigue,’ the overuse of virtual platforms during the ongoing COVID-19 global pandemic (Lee, 2020). The project’s use of a virtual platform also limited participants’ ability to engage in various learning styles. Due to the small sample size, no statistical significance can be drawn from the results of this project. Another limitation can be seen in the pre-session survey, where 40% felt very confident and 60% felt confident in their knowledge and skills in using motivational interviewing. Prior to this educational session, this group already had some confidence in knowledge and skills in using motivational interviewing, which could have influenced their response to the intervention.

Conclusions

The outcomes of this project point to the benefits of an educational session on MI to improve provider’s ability to address vaccine hesitancy. Meaningful results include improvements in assessing vaccine hesitancy and in understanding MI. Furthermore, participants showed a high likelihood to use MI to address vaccine hesitancy.

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<https://doi.org/10.1177/0033354920904074>

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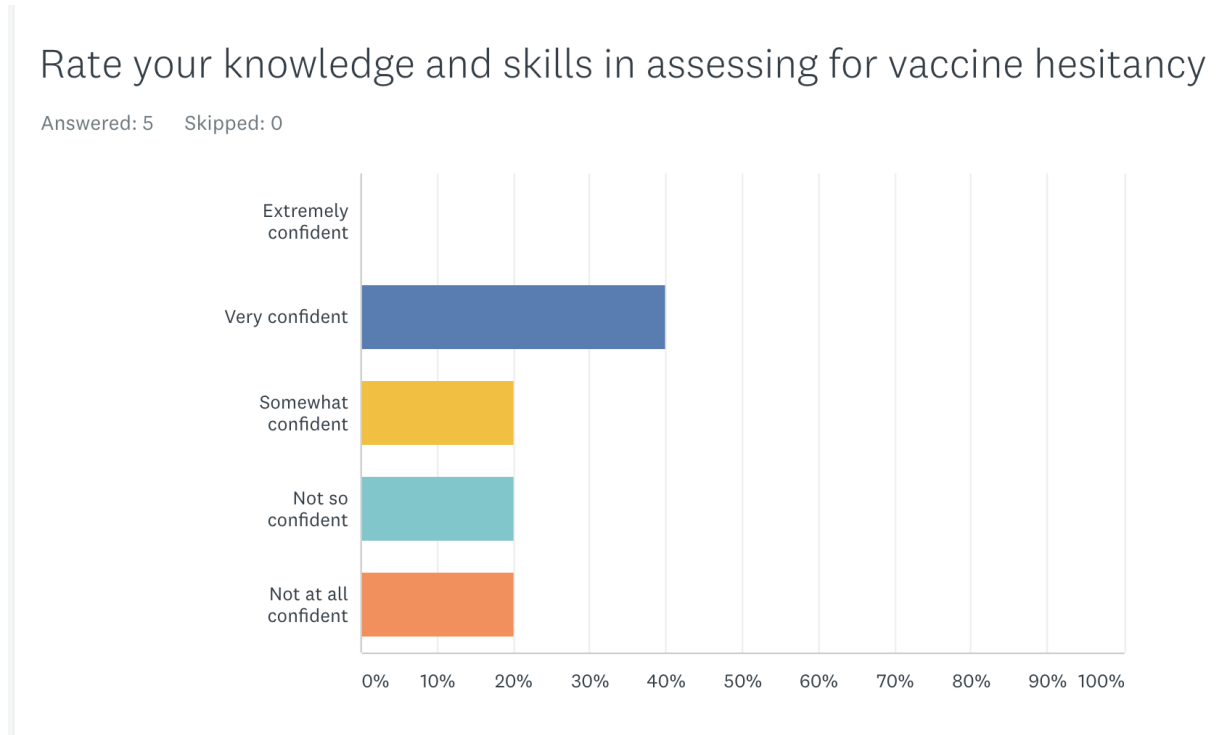
Table 1*Outline of Educational Session*

Objective	Description
Pre-Session Survey	
Define problem of vaccine hesitancy	<p>Overview of vaccine statistics</p> <p>Goals of 2020 National Vaccine Plan</p> <p>Development</p> <p>Vaccine taxonomy</p> <ul style="list-style-type: none"> • 5C Psychological Antecedents of Vaccine Hesitancy • SAGE 5A approach to vaccine hesitancy <p>Anthropological perspective</p>
Review literature for use of MI for vaccine hesitancy	<ul style="list-style-type: none"> • 2018 systematic review showed face to face interventions more effective • 2018 RCT with HPV, MI improved vaccination rates • 2018 RCT on postpartum unit, MI improved vaccination rates • 2019 qualitative study showed training providers in MI improved influenza vaccination rates
Summarize key concepts of MI	
Post-session survey	

Note. Outline of educational session with descriptions of objectives. MI = motivational interviewing

Figure 1

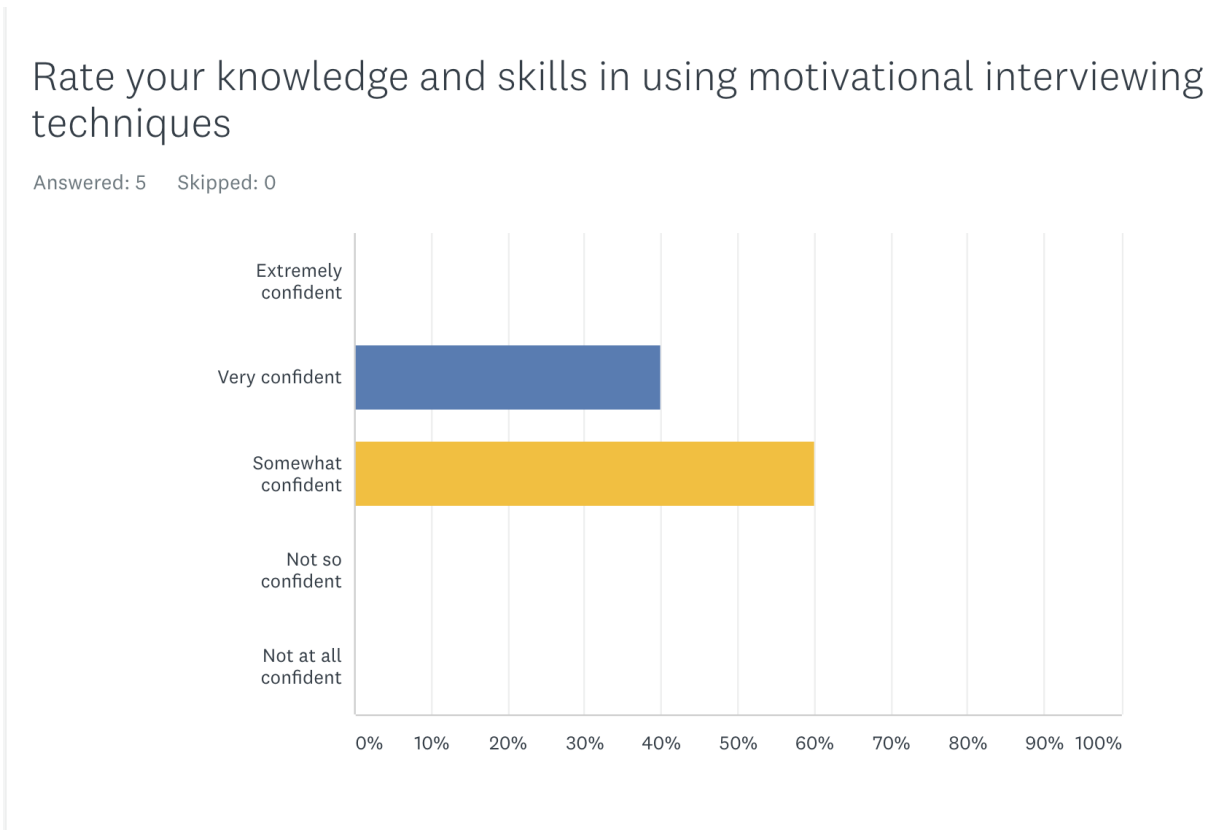
Knowledge and Skills in Assessing Vaccine Hesitancy



Note. Copyright Survey Monkey 2020

Figure 2

Knowledge and Skills in Using Motivational Interviewing



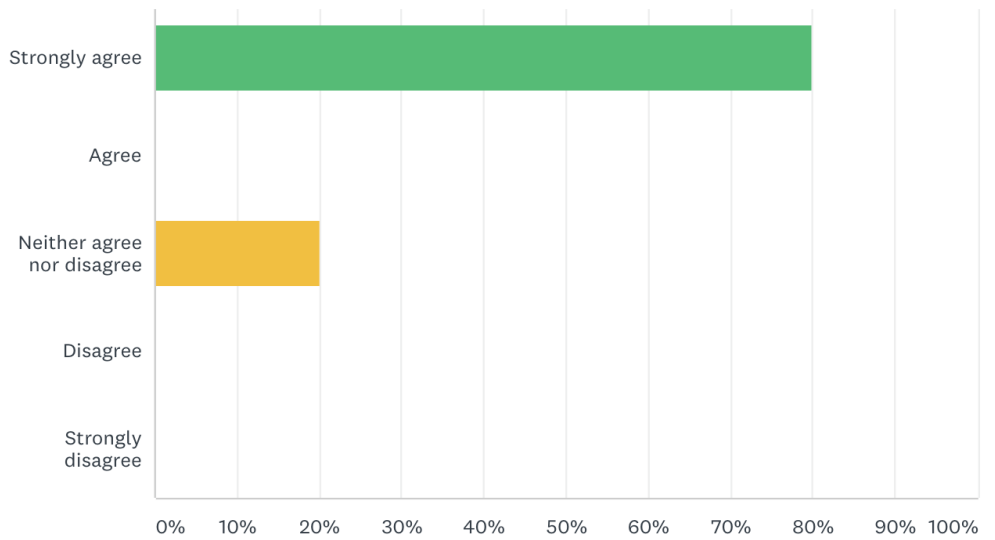
Note. Copyright Survey Monkey 2020

Figure 3

Increased Understanding of Motivational Interviewing

My understanding of motivational interviewing has increased

Answered: 5 Skipped: 0



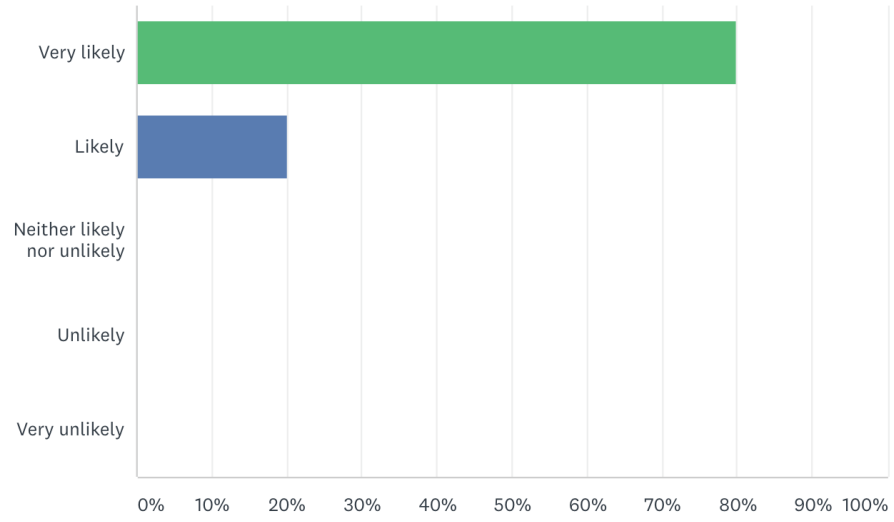
Note. Copyright Survey Monkey 2020

Figure 4

Likelihood to Use Motivational Interviewing

I am likely to utilize motivational interviewing with vaccine hesitant patients.

Answered: 5 Skipped: 0



Note. Copyright Survey Monkey 2020

Appendix A

IRB Approval

Date: 4-21-2021

IRB #: IRB-2021-62

Title: Improving Vaccination Rates: Addressing Vaccine Hesitancy with Motivational Interviewing

Creation Date: 10-12-2020

End Date:

Status: **Approved**

Principal Investigator: Olivia Ball

Review Board: USD IRB

Sponsor:

Study History

Submission Type	Initial	Review Type	Exempt	Decision	Exempt
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Key Study Contacts

Member	Martha Fuller	Role	Co-Principal Investigator	Contact	mfuller@sandiego.edu
Member	Olivia Ball	Role	Principal Investigator	Contact	okearnes@sandiego.edu
Member	Martha Fuller	Role	Primary Contact	Contact	mfuller@sandiego.edu

Appendix B

Letter of Support from Clinical Site

Akeela Benson
1080 Park Blvd
San Diego, CA 92101
November 5, 2020

Representative for Olivia Kearnes
DNP Student
University of San Diego

Dear Representative for Olivia Kearnes:


As the Education Chair of the California Association of Nurse Practitioners, San Diego Central Chapter, I grant Olivia Ball (AKA Kearnes) permission to carry out her evidence based project---*Addressing Vaccine Hesitancy with Motivational Interviewing* for our members to serve as an audience via webinar. She will use anonymous pre/post survey data for analytics and evaluation.

Sincerely,

Akeela Benson MSN, APRN, FNP-C
CANP, San Diego Central Chapter
Education Chair


Appendix C

Poster Presentation



Addressing Vaccine Hesitancy with Motivational Interviewing

Olivia Ball, BSN, PMH RN-BC, DNP-S
Martha G. Fuller, PhD, PPCNP-BC
Akeela Benson, MSN, FNP-C
Semira Semino-Asaro, PhD, PMHNP-BC



Background

Purpose

Evaluation Results

- Vaccine hesitancy is a complex challenge with multiple influencing factors including complacency, confidence, and accessibility.
- The 2020 National Vaccine Development Plan Goal 3: *Enhance knowledge of and confidence in routine vaccines and the immunization system: Research effective communication strategies to reach under immunized populations and address vaccine hesitancy, including messaging*

Improve provider confidence in addressing vaccine hesitancy by educating APRNs on motivational interviewing (MI).


Framework/EBP Model

The Iowa Model was chosen to guide the process of this project.

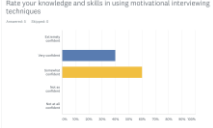
- Identifying problem, PICO question
- Forming a team
- Designing practice change
- Feedback loops at every step

Pre-Session Survey

Rate your knowledge and skills in assessing for vaccine hesitancy




Rate your knowledge and skills in using motivational interviewing techniques




Post Session Survey

My understanding of motivational interviewing has increased



I am likely to utilize motivational interviewing with vaccine hesitant patients



Evidence for Problem

Project Plan Process

Cost Benefit Analysis

- 2019 Measles outbreak left US with highest measles rate since 1992 with 1,282 cases in US. 2020, just 12 cases (CDC, 2020)
- 2018 Influenza Vaccine Rates by age (CDC, 2020)
 - 6 mo. to 17: 50.4%
 - 18-49: 34.2%
 - 50-64: 46.8%
 - 65+: 68.7%
- WHO (2019) estimates that globally 2-3 million deaths a year are prevented by immunizations

July-September 2020: Planning and development of presentation

September 2020: Securing partnership with California Association of Nurse Practitioners (CANP) to provide forum for presentation

November 2020: Presentation given to members of the San Diego CANP chapter

Cost

- By not addressing vaccine hesitancy, declines in herd immunity and increases in preventable infectious disease strain the healthcare system
- One-hour educational session given to APRNs with average NP hourly wage \$59

Benefit

- For every \$1 invested in immunizations, there is a \$44 savings in healthcare costs, lost wages and productivity

Evidence-Based Intervention/Benchmark

Conclusions

Implications for Clinical Practice

Provide an educational session teaching MI related to vaccine hesitancy.

- The multifaceted challenges of vaccine hesitancy require providers to be adept at various communication strategies.
- A brief educational session on MI can help providers gain confidence in how to approach vaccine hesitancy with patients.

- Motivational Interviewing offers an evidence-based approach to aid providers in addressing vaccine hesitancy
- Motivational Interviewing can be taught as a continuing educational session with APRN professional organizations and beyond



