Developing Practice Standards to Target Mental Health Disparities among the Farming Population

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Notes from the Author

I am forever grateful for the partnerships and support that has been provided to me throughout my educational journey at East Carolina University. Being a member of the APRN Rural Scholars program and the partnership with the [redacted], has been one of the most treasured experiences of my life. I am grateful for the mentorship and support of [redacted]. Was without her guidance, this project would not have been possible.

I would like to dedicate this paper to my Memaw (Peggy Joyce Stokely Tepper) who died shortly after I began my DNP journey. Thank you for always believing in me and for encouraging me to reach for the stars. I would also like to dedicate this paper to my precious son, Charlie, and my loving husband, Tyler. Thank you for letting me chase my dreams. I love you always.

Abstract

Mental health is a rising concern among farmers in the United States. Situational stressors related to the nature of their work are often responsible for some of the mental health disparities that currently exist. Situational stressors include changes with the weather, financial strains, issues with family dynamics and more. Detecting mental health disparities among farmers is imperative to their sustainment. A quality improvement project was created to target mental health disparities among farmers using a virtual mental health self-assessment named the Farm Stress Screener. The project was created to raise awareness and provide resources that are currently available through an organization that focuses on the health of farmers and other associated occupations. The theoretical framework that was utilized was the Stress, Coping, and Adaptation Theory that was developed by Richard Lazarus and Susan Folkman. The Farm Stress Screener was sent by email to a list-serve of over 200 participants who were affiliated with the partner site asking for their participation in the project. Over the 12-week implementation period, there were a total of 20 participants, with eight participants screening positive. A positive screen identifies a participant as being potentially at-risk for a mental health concern and required a follow-up phone call from the site partner's nurse. Overall, the Farm Stress Screener was useful in identifying mental health related concerns among the farming population and raised awareness of resources that are currently available through the partner site.

Keywords: Mental health among farmers, situational stressors, mental health, screening, Farm Stress Screener, resources for farmers

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Section I. Introduction

Background

The project partner site is an inter-institutional program that has partnerships with Universities in North Carolina including, North Carolina State University, East Carolina University, and North Carolina Agricultural & Technical University. The mission of this organization is to improve health outcomes and provide practical solutions, through an educational approach, to populations such as: farmers, ranchers, foresters, fishermen, and their families. Partnerships with many community and non-governmental organizations are what drives the partner site's mission. The goal of the partner site is to ensure safety and wellness for all by reducing injury and illness through research and education (North Carolina Agromedicine Institute, 2021).

Organizational Needs Statement

The partner site has contributed tremendous research on depression and stress as it relates to the farming community. Mental health remains a leading health indicator for Healthy People 2020, and special populations such as farmers are associated with health disparities in the United States (Office of Disease Prevention and Health Promotion [ODPHP], n.d.). Farmers and agricultural workers have the highest incidence of suicide compared to the general population in the United States (Ringgenberg, Peek-Asa, Donham, and Ramirez, 2018). Occupational stressors, family dynamics, and economic burdens are just a few of the factors that can contribute to the development of mental health disorders among this group (Marcom et al., 2018).

Healthcare providers often diagnose behavioral health disorders and implement interventions such as counseling, medication therapy, or environmental modifications. There are several different mental health screening tools that are used when diagnosing depression and

suicide, however, these are often implemented in the primary care setting. This presents many challenges to the farming and agricultural communities as many do not have access to a Primary Care Provider (PCP). Lack of a PCP can sometimes be related to situational factors such as lack of insurance or trouble getting to appointments due to long work hours.

Access to appropriate mental health services is one of the biggest challenges that agricultural workers and farmers face. According to Reed and Claunch (2020) agricultural workers along with forestry workers and fishermen have one of the highest rates of suicide, 44.9 and "32.2 per every 100,000" in 2012 and 2015. This is compared with the general occupational rate of suicide which was only "17.3 per every 100,000." The stigma associated with farmers is that they are sometimes reluctant to discuss their emotional needs (Beyer, 2019). This stigma is associated with the persona that farmers are tough and should not complain. The farming community places a strong emphasis on family, and a farmer's family is often the first to notice a change in behavior. It is important that families of farmers and agricultural workers have tools in place to recognize early signs of suicidal ideations and detect when their loved one may be having changes in mental health behavior. Educating and developing programs to target agricultural behavioral health and how to cope with these behaviors are greatly needed. There is also a need for better access to mental health resources in rural communities in North Carolina.

Problem Statement

There is a need for earlier detection of suicidal or mental health symptoms among the farming and agricultural communities, to assist with the prevention of suicide. Because farmers have a high prevalence of suicide when compared to the general population, there is a strong need for intervention. The purpose of this DNP project is to improve mental health resources for the farming and agricultural communities by improving access to mental health resources,

through the development of a virtual Farm Stress Screener, designed specifically for the farming community.

Purpose Statement

The purpose of this project is to improve mental health resources for the farming community. Detecting mental health disorders or suicidal tendencies early, will assist farmers with accessing the resources they need more efficiently. The prevalence of depression and suicidal symptoms among this population will be used to improve behavioral health programs and mental health resources in rural areas of North Carolina.

Section II. Evidence

Literature Review

The search strategy utilized for this project included an intensive literature search and review. The search for this proposed project included utilizing databases such as: PubMed and Ovid. Themes were used to categorize data that were collected to organize information that was found. The themes used were depression in farmers, pesticide exposure and depression, suicide among farmers, farmers with depression and the impact on family, changes in Activities of Daily Living (ADL) related to mental health, and mental health screening tool analysis. Some of the search terms used included: mental health and farmers; pesticide and depression; screening tools and mental health; mood and farmer, suicide and farmer, agriculture, and mental health.

When using the PubMed database search terms such as mental health and farmer, were used. This initial search yielded 307 results. Levels of evidence that were from well-designed controlled studies or of evidence level IV and above were used. Although level IV and above evidence were the most valuable, some of the literature that provided opinions, common trends, and evidence were also kept. These lower levels of evidence were used to gather data regarding opinions, and experiences. Inclusion and exclusion criteria for this search included published data within five years or less, systematic reviews and complementary medicine, human studies, and in the English language. This filtered the search which yielded 28 results. Of this search, six articles were read in entirety and determined to be appropriate for this project. All levels of evidence were used as limited information is available regarding this topic and the population.

When utilizing a search in Ovid the search terms mental health and farmer were also used. This yielded 46 results, the criteria for inclusion and exclusion were that studies must be evidenced based research, full text, published within the last five years, and human studies. The

results were then skimmed briefly to identify topics that were pertinent to this study. Of the 46 results found, seven articles were read in entirety. These studies were deemed appropriate for this project and kept for support. All levels of evidence were used for this study, as limited research and data is available, otherwise.

The search continued in both databases, PubMed and Ovid, and search terms such as pesticides and depression; screening tool and mental health; mood and farmer, suicide and farmer, agriculture, and mental health, were used. A total of eight articles were kept in total from these searches to provide supporting data for this project. Inclusion and exclusion criteria of articles that were full text, published within the last five years, and in the English language were used.

Current State of Knowledge

When reviewing the literature that was found to support this project, limited literature was available related to depression and farming, and evidence related to suicide and depression in this population was also scarce. The literature showed that there were currently no specific mental health screening tools that were being used to assess suicide and depression specifically for the farming and agricultural population. However, studies show that farmers and agricultural workers have almost double the risk of suicide when compared to the general population (Reed & Claunch, 2020). The effects of chronic stress on farmers and agricultural workers often leads to physical, cognitive, or behavioral changes (Daghagh Yazd, Wheeler, & Zuo, 2019). There are no current guidelines or expectations specifically for this population which creates barriers when assessing the needs of this community. The literature that was found was very limited in defining what barriers exist between mental health disorders and outcomes among farmers. Significant patterns show that there may be some correlation between pesticide exposure and the

development of mental health disorders, however, further research is needed on this topic (Koh et al., 2017).

There was a common trend voiced throughout many studies. The trend was that the first sign that farmers often show, are subtle changes in behavior or activities of daily living. Many studies stated that farmers with mental health disorders often exhibit changes in sleep patterns, decline in self-care, mood changes, or develop headaches during the early stages of undiagnosed depression or anxiety (Jones, Reed, & Hunt, 2017). Other studies identified a need to implement interventions to treat mental health disorders such as anxiety or depression, by utilizing lower thresholds when using depression screening tools such as the GAD-7 or PHQ-9 (Rudolphi, Berg, & Parsaik, 2020). Assessment of changes in behavior patterns, management of personal stressors, and physical factors, are all important factors to consider when screening this population for mental health disorders.

Current Approaches to Solving Population Problem(s)

Currently the partner site has several different programs that focus on mental health. The primary focus of all these programs are to raise awareness surrounding mental health in the farming community. The partner site has many different grants that are currently working towards assisting farmers and agricultural workers with obtaining resources when they find themselves in a crisis. Some of the current grant projects that the Institute is responsible for are the North Carolina Tobacco Trust Fund which provides basic awareness, training, and emphasis on behavioral health among farmers (North Carolina Agromedicine Institute, 2021). There are resources through this program that allows farmers, and other related occupations, to have three free counseling sessions. Many of the other grant programs focus on providing financial resources and interventions to help with some of the everyday stress that farmers face.

While the Institute works to raise awareness surrounding mental health disorders, there is also a need for a more efficient method of communication with this special population. Because farmers often work long hours, and have limited time or resources available to them, receiving mental health assistance can be problematic. Finding a way to communicate in a manner that keeps farmers at home or on the farm is needed. Because farmers make up about 2% of the nation's population, and provide roughly 98% of our farm commodities, it is imperative that we implement change and provide more behavioral health resources to this community to ensure their sustainment (Marcom et al., 2018).

Evidence to Support the Intervention

Mental health screening tools are used by healthcare providers to help diagnose mental health disorders. Research shows that the farming population has higher rates of suicide and depression than all other occupations (Reed & Claunch, 2020). Agricultural workers along with forestry workers and fishermen have one of the highest rates of suicide, "44.9 and 32.2" per every "100,000" in 2012 and 2015. This is compared with the general occupational rate of suicide which was only "17.3 per every 100,000" (Reed & Claunch, 2020).

Utilizing feedback from healthcare providers and farmers revealed that using laymen terms when discussing sensitive topics may be more effective than using medical terms such as anxiety, depression, suicide (Arend, 2019). This creates a need for a more tailored screening process that can be used to assess mental health disorders in this community. The goal of using a more tailored screening process, will be to assist healthcare providers with earlier detection of mental health disorders among this special group.

A four-question mental health self-assessment called the Farm Stress Screener was designed using a web application program. An initial email was sent to a listserv of over 200

farmers who are affiliated with the partner site. This program's goal was to improve access and raise awareness of mental health resources that are available through the partner site. The questions in the Farm Stress Screener were designed using simple laymen terms and were easily accessible to all participants. An email with a link to the survey was sent once a week for 12 weeks to all participants who registered. Examples of the types of questions asked included a focus on changes in Activities of Daily Living (ADL): changes in sleep patterns, lack of self-care, or changes in activities that are enjoyable, see appendix A. This questionnaire was used to provide feedback on the prevalence of mental health disorders and the effects of this type of communication on the farming community and other associated occupations. Data collected included demographics such as age, gender, county of residence in NC, and occupation, see Appendix B. The goal of the Farm Stress Screener was to improve and raise awareness of mental health resources available through the partner site. This will increase access to mental health resources to farmers and other related occupations in all areas of North Carolina, and to implement a change in current mental health assessment among this community in the future.

Evidence-Based Practice Framework

Identification of the Framework

As previously discussed, there is currently a gap between mental health among farmers and the resources that are needed. There is a strong need for a better assessment process for mental health awareness and developing strategies to communicate better with farmers. The way that farmers cope with stress largely contributes to the outcomes that they face. The theory that will be used to support this project is the Stress, Coping, and Adaptation Theory that was developed by Richard Lazarus and Susan Folkman (Folkman & Lazarus, 1988). This theory focuses on stress and the idea that people respond to stress in different ways. Stress is then

divided into different appraisal levels which focus on the components of their coping process. Factors that affect how a person deals with stress are determined by two components: person-environment relationships and appraisals (Folkman & Lazarus, 1988). Environmental factors include personal values, beliefs, and social networking. The cognitive appraisal component focuses on how a person perceives that stress and how it is judged, evaluated, and then coped with (Folkman & Lazarus, 1988).

This theoretical framework will coincide with this project's goal as to focus on changes in behavior that correlate with the development of mental health disorders among farmers. Different levels of coping and the perception of stress can also contribute to how farmers manage depression, anxiety, and other psychological problems. It is imperative that the fundamentals of mental health disorders in this special population are evaluated.

Ethical Consideration & Protection of Human Subjects

Ethical considerations for this project focus on preserving every participant's best interest. It is important to emphasize that all data collected for this project will be confidential and not expose any of the participants personal or private information. The information obtained for this project will not harm or hurt participants in anyway. This information was used to gain insight into common mental health disorders among farmers, to be used by health care professionals and the partner site. This project will also be equal and equitious, in that both male and female participants of any age, race, or ethnic background will be considered and treated fairly. There was no potential for anyone to be taken advantage of during this project as the focus was to emphasize the need for mental health improvement process for farmers and with the goal of providing substantial resources.

To prepare for the ethical consideration portion of this project a training course in the Collaborative Institutional Training Initiative (CITI) program was completed. This training focused on the development of social and behavioral considerations that are the foundation of ethical research. To receive approval to continue with this project, formal Institutional Review Board (IRB) approval was required by the East Carolina University College of Nursing. This included a formal review through ECU's Medical Center Institutional Review Board (UMCIRB) which serves both the "Institute" and the ECU College of Nursing. This review process ensures that all projects are ethically appropriate and that human rights are protected. Formal IRB approval was granted, and this project was identified as Exempt Level II project. Level II project is identified as interactions by the principal investigator through educational tests, such as surveys, while the identity of the individual's identity was kept confidential. This did not require frequent follow-up with the IRB.

Section III. Project Design

Project Site and Population

The project site was an organization that focuses on the improvement of health for farmers and their families and the site champion for this project was affiliated with the project site. The population that this project targeted were all farmers in different counties of North Carolina. Other demographical data collected included: occupation, gender, county of residence, and age range. The benefits of this program were that it was successful in providing a convenient self-assessment process that farmers could access in the privacy of their own homes, while working, or on their mobile device. The convenience of this program allowed farmers to be directed to the services they needed in a private and confidential setting.

Description of the Setting

The setting of this project was primarily online and via web communication with the partner site. The partner site is an inter-institutional program that has partnerships with several North Carolina Universities including North Carolina State University, East Carolina University, and North Carolina Agricultural & Technical University. The partner site was located in Greenville, North Carolina, but provides outreach programs to all counties in North Carolina. Due to restrictions related to the COVID-19 pandemic, virtual communication was used for much of this project. The screener was sent to participants via email once weekly for 12 weeks. Participants who had not completed the screener were sent a reminder email that was automatically generated by a secure data collection program called Research Electronic Data Capture (REDCap). This program allows for protection of data collection. A nurse affiliated with the partner site communicated with participants via phone call from the nurse's home

location. Participants were contacted in their home area at the phone number that was provided during registration, and no travel was required.

Description of the Population

The population of this project consisted of farmers, farmworkers, and family of farmers, who related to the partner site. The partner site has a list serv of over two- hundred farmers and farmworkers who the Farm Stress Screener was sent to via email. The participants were from all different regions in North Carolina, and participants specified their county of residence during the registration process. The screener was also made available on the partner site's three Facebook pages. The target population were all types of farmers in North Carolina, but data was collected from other associated occupations as well. This includes family of farmers, farmworkers, loggers, and fishermen. This data was used to assess the prevalence of mental health disorders among farmers and associated occupations in North Carolina by different county, age, and gender.

Project Team

The project team consists of Kelsey Booth, Doctor of Nursing Practice -Family Nurse Practitioner student who is responsible for this project. ECU Faculty of record was also responsible for follow-up with the student responsible for this project. The site champion for this project was affiliated with the project site. The East Carolina University ITCS department was involved in development of the Farm Stress Screener designed specifically for farmers. There were two nurses affiliated with the project site who were responsible for the follow-up calls to positive screens.

Project Goals and Outcome Measures

The primary goal of this project was to increase access to mental health resources among the farming community, that are available through the project site. The secondary goal is to provide a convenient process to help with raising awareness of the resources that are available while increasing participation in a mental health self-assessment. The approval process consisted of ensuring support from the project site, specifically through the site champion. The East Carolina University Institutional Review Board (IRB) was also responsible for granting approval for this project. Data was collected in the form of an electronic database using Microsoft Excel and REDCap. This data was analyzed at the end of the project implementation period. When analyzing this data, the focus was on recognizing trends among age, gender, and geographical location, and the prevalence of the use of the self-assessment program. Participants who were deemed a positive screen and who received a follow-up call from a nurse were also recorded. The interventions that were provided to these participants were recorded, as well as a connection to appropriate resources. The outcome was that farmers and other related occupations could conveniently complete the Farm Stress Screener and recognize that support and resources were available.

Description of the Methods and Measurement

Methods

An initial email, see appendix D, was sent to a combination of an internal list (of the project site) of over 200 farmers, as well as through email to Cooperative Extension, commodity groups, and Farm Bureau. This link was also displayed on the project site's three Facebook pages. The initial email included information about the Farm Stress Screener and a link for the participant to register. The participant then reviewed a consent agreement, see appendix C, and was able to proceed to register by entering the appropriate demographical data, and their contact

information including email and phone number, see appendix B. The participant was sent a recurring email with an individualized link each week, see appendix E, this link was autogenerated by a program called REDcap. From this point the participant was able to access the Farm Stress Screener and select the appropriate responses as applicable to them, each week. If a participant answered two or more questions as true, then they would receive a phone call from a nurse at the project site. The nurse follow-up calls were used to assess the participant's needs to determine what interventions or resources would benefit them. The nurses utilized a nurse follow-up call template, see appendix F, to provide structure to the conversation. A confidential log was kept of the calls made by the project site nurse, participant email and phone number, and what interventions were utilized. Because the project site has several programs currently in place, the follow-up call was used as a bridge to connect the participant with a resource that would benefit them long term. An example of this includes, connecting a participant to a peer farmer through the project site's Farmer to Farmer program.

Measurement

The data collected for this project included demographical data that was collected during the registration process. This included: age range, county of residence, occupation, and gender. An example of the demographical data collected is shown in Appendix B. By using a personalized automatically generated link through REDCap, participant responses were trended over a 12-week period. The log of calls made by the site partner's nurse was also collected and used to determine how effective the Farm Stress Screener was in providing resources to this special population. Other information that was collected focused on how frequently the Farm Stress Screener was used, how different responses correlated to different ages, genders,

geographical regions, time spent on the follow-up call, and participant responses following a nurse call.

Discussion of the Data Collection Process

The process for data collection consisted of utilizing a database to record all participant responses, through Microsoft Excel and REDCap. Each participant was given a personal automated link that was auto generated by a computer software known as REDCap. The participant provided personal demographic information during registration, that was linked to this data. Every week the participant received an email to participate in the Farm Stress Screener. Once the participant completed the four questions, the screening tool collected the individual's responses, and provided data on the participant's answer choices from week to week. Examples of the questions used in the Farm Stress Screener are shown in Appendix A. Other information was collected manually by the site partner's nurse when a notification was received that a participant had a positive screen and needed to be contacted. The nurse manually recorded a summary of the call, time spent on the call, and what interventions or resources were provided. This data was used to assess the functionality of the Farm Stress Screener and if it was useful in increasing access and awareness of appropriate resources.

Implementation Plan

The implementation of this project took place over twelve weeks starting February 23, 2021 and ended May 11, 2021. Participants registered to receive the weekly email to participate in the Farm Stress Screener. An autogenerated email was sent out once weekly at 0730 for 12 weeks to all participants who had registered, see appendix E. This message conveyed a simple greeting and provided a link for participants to complete the self-assessment. Once completed, the participants were led to a final screen which provided a link to different resources related to

mental health among the farming community, see appendix G. The suicide hotline number was listed along with other available programs that are currently available through the partner site. Data was collected throughout the twelve-week implementation period. This included recording all participant responses from week to week, demographical data of participants, along with the number of positive screens per week, the interventions provided by the site partner's nurse, and the time spent on each follow-up call. This data was used to determine the effectiveness of the Farm Stress Screener along with the usefulness in providing resources to this special population. Information collected was also used to determine how effective the screening program was in reaching farmers in different regions of the state as well as connecting them with appropriate resources.

Evaluation tools that were utilized during implementation period included the Plan Do Study Act (PDSA) method. Examples of the PDSA tool that were used are shown in Appendix H. The PDSA method was the best tool to use as this project was focused on developing a virtual approach to targeting mental health disparities among the farming population. The PDSA tool was useful as it allowed for changes to be made in a systematic and collaborative approach. The goal was to build from what information was gathered during the project implementation period, and gain insight into the mental health disparity that currently exists among farmers in North Carolina.

Timeline

In the fall of 2020, a virtual Farm Stress Screener was developed with assistance from the partner site and an (IT) department at East Carolina University. This program was implemented in the spring semester of 2021 for a course of twelve weeks (February 23-May 11, 2021), see appendix I. After twelve weeks of implementation, data was collected, and information was

sorted and analyzed. At the end of the spring semester 2021, all data that was collected was analyzed and a formal paper was written explaining the outcome of the DNP Project. In the summer of 2021, a formal DNP presentation took place to present the results of this project to a panel of DNP faculty on July 13, 2021. The program will continue to be used by the project site partner and will be used as a sustainable resource upon completion of the project.

Section IV. Results and Findings

After twelve weeks of project implementation, there were a total of 20 participants in the Farm Stress Screener which yielded eight positive screens. A positive screen means that a participant answered true to two or more of the responses and was deemed to potentially be "at risk." The demographical data collected on those who took part in this study varied. Respondents from many different counties in North Carolina took part in the screener for recurrent weeks. However, some participants did not participate for the full twelve weeks of project implementation.

The data collected included participant responses from week to week, their contact information which included an email address and phone number, as well as their age range, gender, county of residence, and occupation. When a participant was noted to have a positive screen, a confidential email was communicated between the principal investigator and the site partner's team. This team included the site champion, principal investigator, and the site partner's Nurse. The site partner's nurse then called the number provided in the consent and registration process and was able to discuss the results of the screener with the participant.

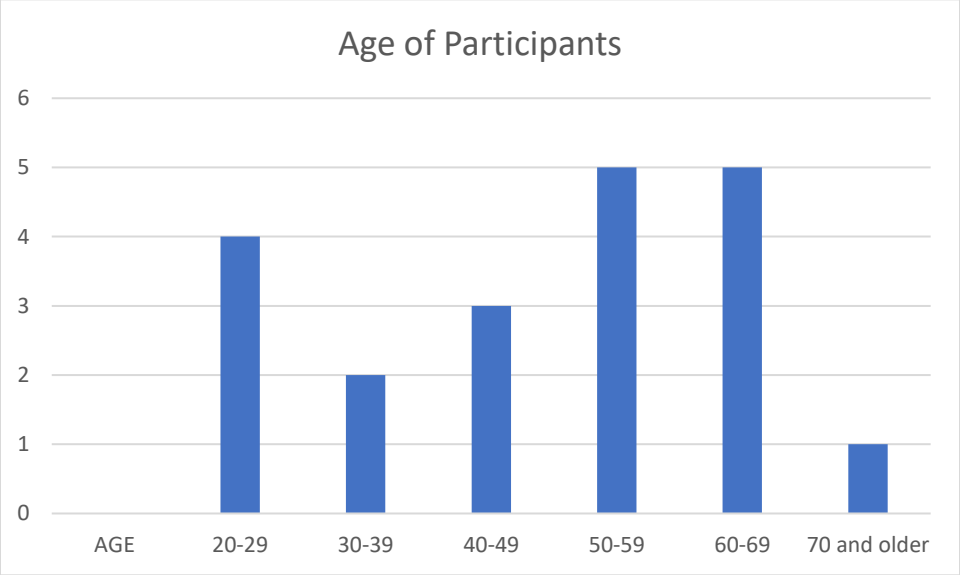
There were several participants who had a positive screen and were referred to appropriate resources, while a few were unable to be reached at the contact information provided. Participants who screened positive and continued to complete the screener after the nurse follow-up call, often showed improvement in their responses. This indicates that there may be some benefit to utilizing this mental health screening process to provide appropriate resources to this special population.

Results

There were 20 total participants throughout the twelve-week implementation period. The demographical information of the 20 participants showed that there was a range of different ages, occupations, and county of residence in NC. Of those respondents 12 were female, and 8 identified as male. The counties of NC where these respondents resided included: Lee, Nash, Wake, Cabarrus, Sampson, Alamance, Granville, Rutherford, Bladen, Cumberland, Hertford, Perquimans, Camden, McDowell, and Iredell.

Figure 1

Age of Participants



The time taken per follow-up call ranged from 6 minutes to 1 hour. Resources and interventions that were provided during these follow-up calls include: Peer farmer referrals, NC Legal Aid contact information, Landloss.org, NCagmeditation.org, Carolina Farm Credit Employee Assistance Program, Community Health Clinic referral, counselor referral, referral to Hopeline and crisis intervention, and referral to a family practice provider. One phone

occurrence required the site partner's nurse to call the suicide crisis/Hopeline while on the phone with the participant.

Figure 2

Occupation of Positive Screens

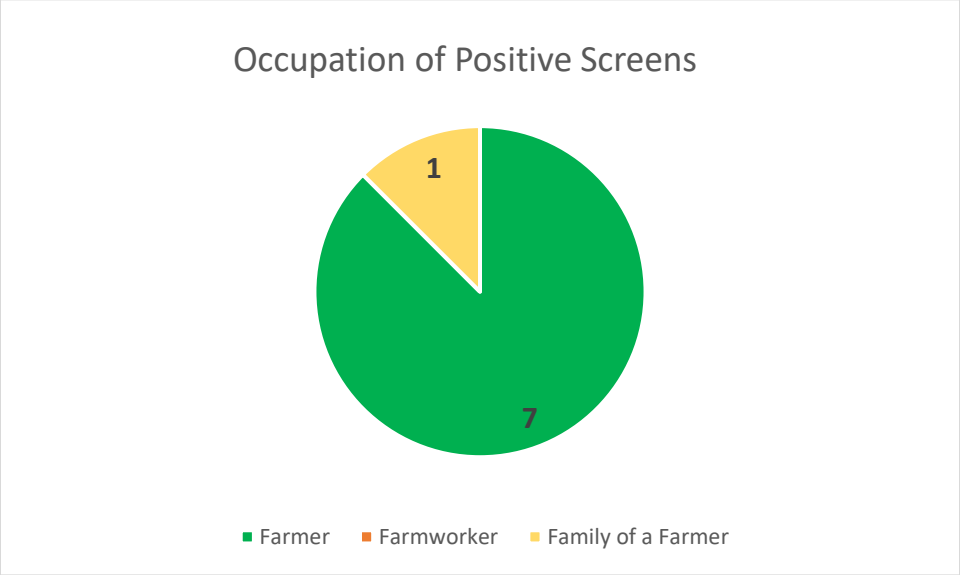
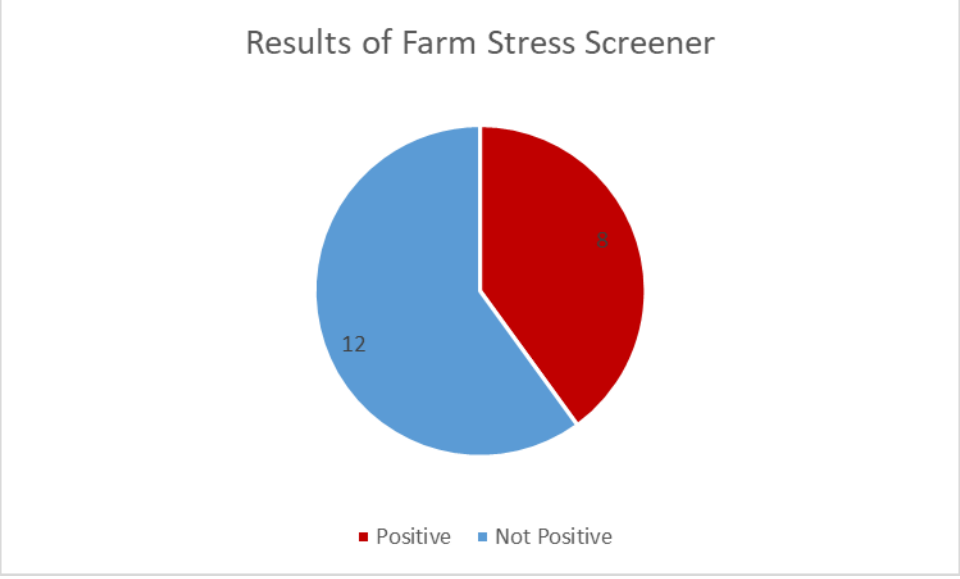


Figure 3

Results of Farm Stress Screener



Discussion of Major Findings

The evidence found in the literature surrounding mental health and the farming community was valid. There is a high prevalence of mental health concerns and suicide among farmers and related occupations when compared to the average population for many different reasons. One of the most significant findings in this project was that mental health disparities in this special group often stem from work-related stress and other associated factors. Many of the participants often voiced stressors included factors such as: concerns about finances, weather, equipment malfunctions and economical burdens. These concerns were often contributing to respondents' lack of sleep, lack of interest in doing things they enjoy, and feeling as if there was no way out of what they were dealing with. The major finding of this project was that mental health disparities among the faming population are prevalent among all age ranges. 40% of the participants resulted in a positive screen through this virtual self-assessment. Another finding was that female farmers are more likely to complete a virtual self-assessment when compared to men.

Ultimately, the resources provided to some of the participants were useful in connecting the participant with a health care provider, other resources, or a peer farmer for continued support. Several of the peer farmer connections are ongoing and have helped the participant after the implementation period had ended. It was also evident that using a self-assessment was a useful process to help participants who were unable to be contacted, as even though some participants did not speak with the site partner's nurse, they continued to complete the screener from week to week and often showed improvement in answer responses. Improvement was quantified as changing of answers to the Farm Stress Screener from week to week.

Section V. Interpretation and Implications

Costs and Resource Management

The project was conducted utilizing resources currently available through the site partner. Often the site partner's nurse would have to find time in her day to make the follow-up phone call in response to a positive participant screening. If she was participating in this follow-up call, then other obligations were on hold. The nurse spent roughly thirty minutes to an hour on each follow-up call when factoring in the resource she provided and the time spent documenting and preparing for the call.

There were several factors that caused the project to have certain limitations, which resulted in the total cost of the project being $435.00. This was the total cost of creating an application in REDCap (a third-party data collection system) with automated response and data collection mechanisms. The REDCap program was developed by East Carolina University's College of Nursing Information Technology Department. Using a third-party data collection system, such as REDCap, allowed for a stream-lined cost-effective approach. The time spent tracking respondent answers, logging positive screens, and data collection was approximately one to two hours daily during the twelve-week implementation period. The data collection tool required manual entry, which could have been a cost-saving approach if this had not been a student project.

There were benefits of the costs and resources used to fund this project. The benefits were that some of the participants contacted were able to be provided with appropriate resources, while others either did not answer the site partner's nurse phone call or did not have time to talk. The downside throughout the implementation period was trying to find more participants to take

part in the project. Other problems included difficulty contacting some participants via phone call.

This project was useful as an adjunct tool to connect participants with programs that currently exist with the site partner. It was also useful in identifying potentially at-risk individuals who may have been struggling with a mental health or stress related concern. The use of a virtual self-assessment was also helpful in connecting with individuals in many different areas of the state, which was useful in raising awareness and increasing access to resources that may not have been available otherwise.

Implications of the Findings

Overall, this project was beneficial in allowing participants who had been struggling with a mental health or stress related concern connect to the resources they needed in a timely manner. There were eight positive screens out of 20 total participants and resources were provided to most of the participants who were contacted. There were several downfalls to the screener, one of which, was that there was no personal identification information, so often the follow-up call was done blindly by the site partner's nurse. This created some barriers in creating trust with the respondent when calling initially but was necessary to ensure that all personal information was protected for the sake of this project. Other downfalls were that not all eight of the participants were able to be contacted by phone call as some did not answer or return the call of the site partner nurse.

There were many lessons learned throughout this project. The initial email asking for participation in the project was sent out at the beginning of implementation period to over two-hundred farmers and other related occupations. There were several participants who started to register, but then opted out after having to input their phone number and email address. The

take-away from this was that farmers and other related occupations are often a more conservative community, and alternative contact information may be received better in the future. It would also have been more useful to have more personal identification information, which may have included at least a first name to assist with identifying the participant during the follow-up call. Other implications include restructuring some of the wording of some of the questions which would have created a clearer representation of the problem.

The project made a difference in the lives of those who agreed to participate and who received a positive screen. The resources provided to many of the positive screens were beneficial in raising awareness surrounding the resources that are currently available, as well as providing a mechanism for outreach to those who screened positive. This project was useful in connecting farmers and other related occupations with available resources during the COVID-19 global pandemic. This project can continue to have a positive impact on the health and wellness of farmers and other related occupations.

Implications for Patients

This project was useful in connecting with farmers, farmworkers, and family of farmers in the setting of their own home and did not require an in-person visit. This was useful and may be beneficial when caring for other specialty populations who lack resources, transportation, or have time-constrictions. Ultimately, the farming population often deals with work-related stressors and other contributing factors that should be factored into their care.

Implications for Nursing Practice

The implication for nursing practice is that farmers and other related occupations often deal with mental health concerns and lack appropriate resources and connections. Utilizing questionnaires related to self-care, situational factors, stress, and family dynamics may be

beneficial when caring for this special group. This form of self-assessment may also be useful in different settings for future use.

Impact for Healthcare System(s)

The impact of this project on healthcare systems, are that this type of virtual communication has proven to be useful to connect and communicate with special populations such as farmers. Utilizing outreach measures such as follow-up calls and questionnaires is also a useful tactic. There may be further utility of a virtual questionnaire to target other special populations or create outreach to other specialty areas.

Sustainability

This project could be sustainable with a few revisions in the future. Ultimately, one of the biggest issues was not having any identification of the participant, other than their email address and phone number. This project also required IRB approval and the use of a formal consent for participation in the research. This consent process could also be revised in the future as this deterred many from completing the full registration process and entering in their personal information. Rewording of questions or the addition of more demographical information would also be useful in understanding more about the effects of farm stress and mental health related disorders among farmers, farmworkers, and family of farmers.

Dissemination Plan

This project will be disseminated and presented at the East Carolina University College of Nursing project presentation on July 13, 2021. It was also submitted to *The ScholarShip* which is a digital repository for scholarship and research at East Carolina University. A poster presentation took place at East Carolina university, see appendix J. This project may be

continued for future use and will be taken over by the project site at the completion of the principal investigator's project.

Section VI. Conclusion

Limitations and Facilitators

Limitations of this project include a limited final sample size and difficulty getting more participants to take part in the project. The formal consent process and the demographical data requirements created some limitations. Other limitations include not having personal identification information including participant's name when calling to make a follow-up call to check on a positive screen. Additional limitations include having to use a third-party model for data tracking, REDCap, and not being able to utilize our anticipated custom model.

Facilitators of the project were collaborating and working with connections and current programs that the project site currently had in place. This allowed the Farm Stress Screener to act adjunctly to aid with referrals and process improvement. The most valuable resource currently available is the Farmer to Farmer program which connects farmers, farmworkers, or family of farmers with a peer farmer to provide support and practical solutions.

Recommendations for Others

This project had many challenges and limitations; however, it was successful in identifying gaps in mental health and providing resources to the at-risk participants. The project would have been stronger if there was a custom model that was used rather than using a third-party data storage application (REDCap), and if the consent could have been simplified in a way that would not deter participants from agreeing to participate. Other functionality and a simpler data-logging process would also have been beneficial. Some participants who received a positive screen suggested that the wording of some of the questions were "vague," and rewording of the questions would be beneficial in the future.

Recommendations Further Study

This project was a huge learning experience for all involved. This project would be useful with some modification and could possibly be used as a personal self-assessment screening program, that participants could use to self-assess their current state of mental health. This would require the participant to seek help or outreach on their own terms but would possibly allow more participants to complete the questionnaire. Sending out the screener to the same participants every week was somewhat beneficial as participants changed their answers from week to week, which sometimes resulted in a positive screen. However, it seemed to be more useful when the participant was completing the self-assessment initially, which is when the most positive screens resulted. This project could be applicable to different settings and populations of people as it is a virtual method to complete a self-assessment.

Final Thoughts

This project was designed to provide a virtual self-assessment to farmers, farmworkers, family of farmers, and other related occupations to help provide this population with appropriate resources and raise awareness about the mental health concerns within this community. Ultimately, the Farm Stress Screener was useful in identifying individuals at risk for mental health concerns and useful in raising awareness and providing resources for those who were contacted.

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Appendix A

Questions for Farm Stress Screener

1. I have had trouble sleeping or getting out of bed within the past two weeks and I don't know why .

A) True

B) False

-True response adds 1 point

2. I have not felt like getting dressed, shaving, or taking care of myself in the past two weeks.

A) True

B) False

-True response adds 1 point

3. I am feeling overwhelmed with my current situation.

A) True

B) False

-True response adds 1 point

4. I feel like there is no way out of what I am dealing with.

A) True

B) False

-True response adds 1 point and is an automatic flag.

Scoring:

-Automatic Flag questions Question 4 lead to automatic follow-up call from Agmed nurse

-If the score is 2/4, considered a positive screen, participant will receive a follow-up call from an Agmed nurse.

Appendix B

Demographic Data

Format-

- Occupation - (drop down option)
  -Farmer
  -Family of a farmer
  -Farmworker
  -Logger
  -Fisherman
  -Other

- Age- (range format)
  -20-29
  -30-39
  -40-49
  -50-59
  -60-69
  -70 or older
- Gender-
  -Male
  -Female
  -Neutral

- Location- Drop down option of Counties in NC
  - (List of counties listed on next page)

- Email Address
- Phone number
- Other information

-Disclosure agreement on home page

-Agreement/Consent saying that you agree to be contacted by the NC Agromedicine Institute/ECU and that this is a student project (see formal consent on Appendix __).

NC County List

(Drop down list for participant selection during registration)

Alamance

Alexander

Alleghany

Anson

Ashe

Avery

Beaufort

Bertie

Bladen

Brunswick

Buncombe

Burke

Cabarrus

Caldwell

Camden

Carteret

Caswell

Catawba

Chatham

Cherokee

Chowan

Clay

Cleveland

Columbus

Craven

Cumberland

Currituck

Dare

Davidson

Davie

Duplin

Durham

Edgecombe

Forsyth

Franklin

Gaston

Gates

Graham

Granville

Greene

Guilford

Halifax

Harnett

Haywood

Henderson

Hertford

Hoke

Hyde

Iredell

Jackson

Johnston

Jones

Lee

Lenoir

Lincoln

McDowell

Macon

Madison

Martin

Mecklenburg

Mitchell

Montgomery

Moore

Nash

New Hanover

Northampton

Onslow

Orange

Pamlico

Pasquotank

Pender

Perquimans

Person

Pitt

Polk

Randolph

Richmond

Robeson

Rockingham

Rowan

Rutherford

Sampson

Scotland

Stanly
Stokes
Surry
Swain
Transylvania
Tyrrell
Union
Vance
Wake
Warren
Washington
Watauga
Other
Wayne
Wilkes
Wilson
Yadkin
Yancey

Appendix C

Consent for Participation

Dear Participant,

I am a student at [redacted] in the Doctor of Nursing Practice program. I am asking you to take part in my project entitled, *"Developing Practice Standards to Target Mental Health Disorders in the Farming Population"*.

The purpose of this project is to engage farmers and other related occupations in a virtual self-assessment that will be used to improve mental health resources for the farming population. By doing this research, I hope to improve mental health screening and access to mental health resources specifically for farmers. Your participation is completely voluntary.

You are being invited to take part in this project because you were identified as a farmer that has worked with the [redacted]. The amount of time it will take you to complete this research is less than 10 minutes each week.

If you agree to take part in this project, you will be asked to register using your email address, phone number, age, occupation, gender, and county of residence. You will be given a personal identifier code which you will use to enter into the screener. The screener consists of four questions which you will be prompted to answer. Upon completion of this screener you may be contacted, by phone, by an [redacted] to discuss your survey results. This call will occur once and take less than 20 minutes. The purpose of the nurse call will be to provide resources that may benefit you. You will be sent a recurring email once weekly for 12 weeks asking you to complete the four questions. Your responses will be saved, and data will be collected over the course of a 12-week period.

This project is overseen by the [redacted]. Therefore, some of the IRB members or the IRB staff may need to review my research data. However, the information you provide will not be linked to you. Your identity (email address and phone number) will be evident to those individuals who see this information. However, I will take precautions to ensure that anyone not authorized to see your identity will not be given that information.

If you have questions about your rights when taking part in this research, call the [redacted]

You do not have to take part in this research, and you can stop at any time. If you decide you are willing to take part in this study, check the AGREE box below.

Thank you for taking the time to participate in my project.

Sincerely,
Kelsey C. Booth, Principal Investigator

Email [redacted]

Appendix D
Initial Email

Good Morning,

My name is Kelsey Booth and I am a Doctor of Nursing Practice-Family Nurse Practitioner student at [redacted]. As a farmer that has worked with the [redacted], you are being invited to participate in my project entitled, "Developing Practice Standards to Target Mental Health Disparities among the Farming Population."

The purpose of this study is to learn about mental health concerns among farmers using a virtual 'Farm Stress Screener'. The hope is to improve mental health screening and access to mental health resources specifically for farmers. If you agree to participate, you will be asked questions about your mental health and agree to be contacted by phone call by the [redacted]

Your participation is completely voluntary. You do not have to participate and can stop at any time. The amount of time it will take you to complete the screener is less than 10 minutes.

If you agree to participate, please select the link below, review the consent, and complete the registration. You will be sent a recurring email once weekly for the course of the next 12 weeks.

Thank you for participating in my project.

Appendix E
Weekly Recurring Email

Good Morning,

Please take a moment to complete your weekly Farm Stress Screener. These four questions will take you less than 10 minutes to complete.

If you exit the survey or take longer than 30 minutes to complete you may have to re-register using a new email address, as the system will log you out. You may be contacted by an NC Agromedicine Nurse to discuss available resources if deemed necessary. This would be a brief phone call and will not take much of your time.

Your participation is greatly appreciated in this research project. Thank you again for your time.

You may open the survey in your web browser by clicking the link below: Weekly Screener

If the link above does not work, try copying the link below into your web browser: (individualized link per participant)

This link is unique to you and should not be forwarded to others.

Appendix F

Nurse Call Template

Hello, my name is _____ I am a Nurse with [redacted]. We received your responses to the Farm Stress Screener that you completed recently, and we wanted to check on you.

-How are you doing today? (Allow open ended question, nurse can ask appropriate questions to follow)

-Tell me more about your current situation you are going through (Open ended question)

-Based on response the nurse can direct the patient to appropriate resources or further intervention.

Interventions could include:

Referral to free counseling sessions available through the [redacted], [redacted] peer to peer program, referral to a healthcare provider, direct to suicide hotline/crisis intervention if needed, and other available resources that may be useful.

-Nurse then records summary of conversation and intervention provided.

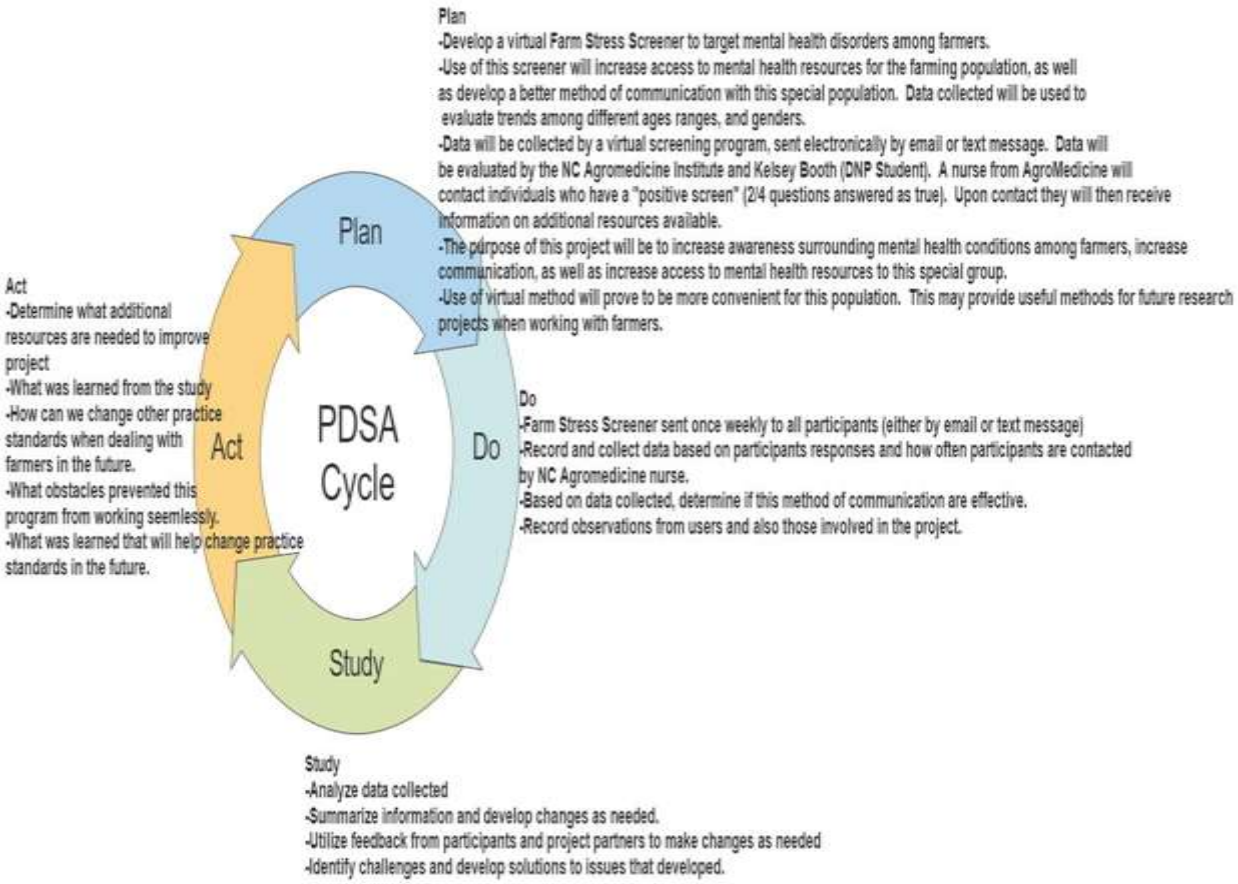
-Nurse does not have to use this template but it is available to structure the format of the follow-up call.

Appendix G

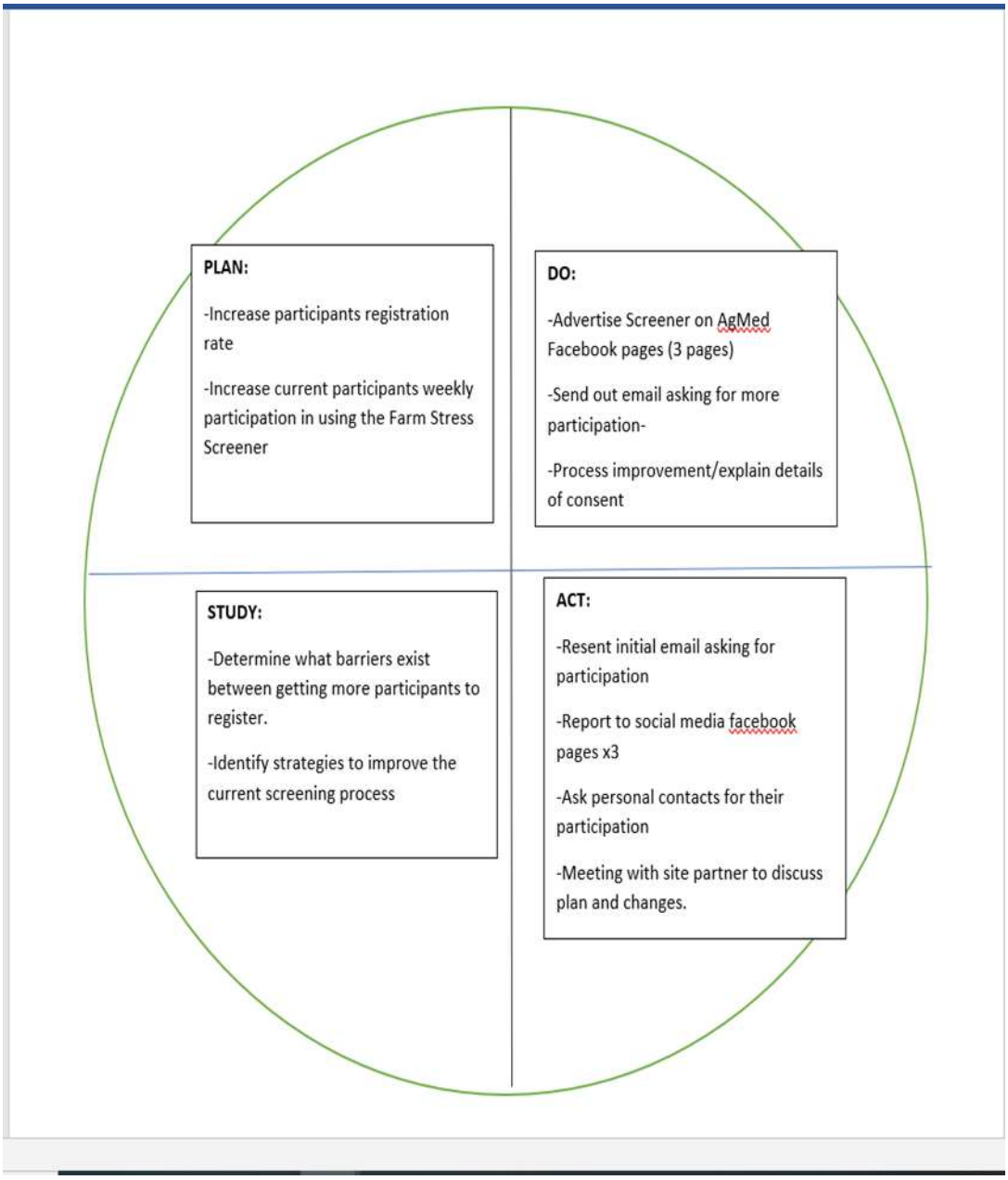
Resource Page

Appendix H

PDSA Cycle I

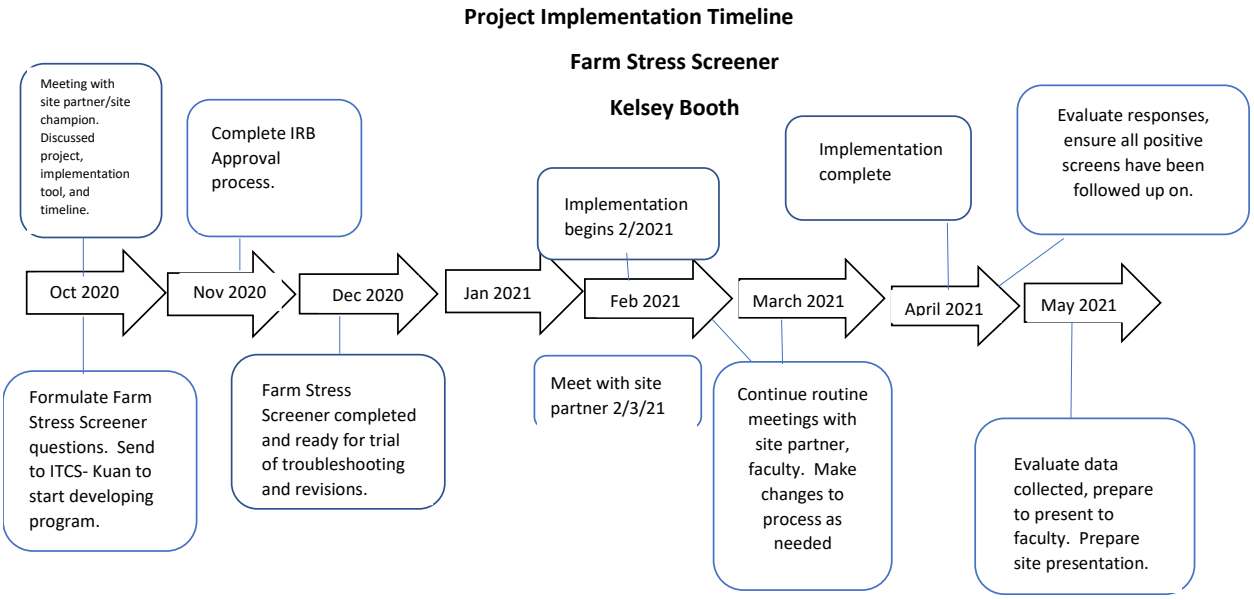


PDSA Cycle II



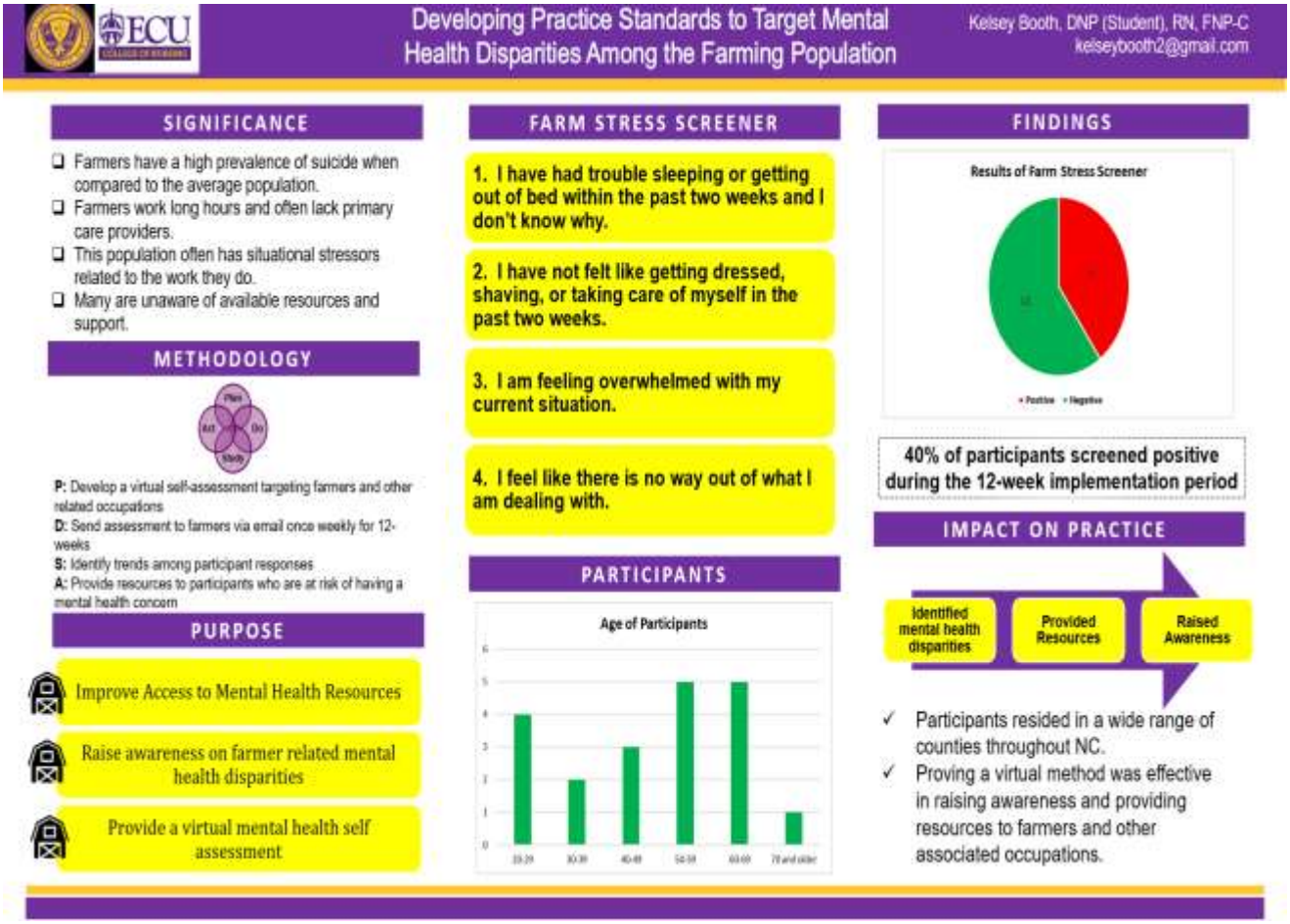
Appendix I

Timeline of Project



Appendix J

Project Poster



Appendix K

Doctor of Nursing Practice Essentials

	Description	Demonstration of Knowledge
Essential I ***Scientific Underpinning for Practice***	**Competency** – Analyzes and uses information to develop practice **Competency** -Integrates knowledge from humanities and science into context of nursing **Competency** -Translates research to improve practice **Competency** -Integrates research, theory, and practice to develop new approaches toward improved practice and outcomes	• The DNP project was based upon research and knowledge surrounding mental health concerns among farmers. • Literature supports findings that mental health related to farmers is a concern. • The theoretical framework for this project was the Stress, Coping, and Adaptation Theory that was developed by Richard Lazarus and Susan Folkman (Folkman & Lazarus, 1988) • The project focused on developing a new approach to targeting mental health disparities among farmers using a virtual mental health self-assessment.
Essential II ***Organizational & Systems Leadership for Quality Improvement & Systems Thinking***	**Competency** –Develops and evaluates practice based on science and integrates policy and humanities **Competency** –Assumes and ensures accountability for quality care and patient safety **Competency** -Demonstrates critical and reflective thinking **Competency** -Advocates for improved quality, access, and cost of health care; monitors costs and budgets **Competency** -Develops and implements innovations incorporating principles of change **Competency** - Effectively communicates practice knowledge in writing and orally to improve quality **Competency** - Develops and evaluates strategies to manage ethical dilemmas in patient care and within health care delivery systems	• Continues collaboration with the NCAI and site champion, College of Nursing IT dept, and faculty throughout this quality improvement project. • Critical thinking used to develop interventions and provide a new form of self-assessment. • Maintained HIPPA/FERPA compliance when collecting information from participants. • Maintained frequent follow-up with site champion, nurses, faculty.

		• Patient outcomes were addressed, and follow-up calls were made to many of the participants. • Data tracking using REDCap was completed every week. • Identified barriers and used the PDSA cycle for improvement.
Essential III ***Clinical Scholarship & Analytical Methods for Evidence-Based Practice***	**Competency** - Critically analyzes literature to determine best practices **Competency** - Implements evaluation processes to measure process and patient outcomes **Competency** - Designs and implements quality improvement strategies to promote safety, efficiency, and equitable quality care for patients **Competency** - Applies knowledge to develop practice guidelines **Competency** - Uses informatics to identify, analyze, and predict best practice and patient outcomes **Competency** - Collaborate in research and disseminate findings	• Literature was reviewed to determine the most up to date information surrounding mental health and farmers. • Implemented a Farm Stress Screener (FSS), which is a mental health self-assessment specifically for farmers. • The FSS was used to identify at-risk individuals and proven to be effective in raising awareness and increasing access to available resources through the NCAI. • The FSS identified a 40% positivity factor among all participants. This confirmed that stress related mental health concerns do exist among this population. • Informatics were used to trend data, analyze, and predict best practice and improve participant outcomes. • Project findings were shared with the NCAI, and the site champion.
Essential IV ***Information Systems – Technology &***	**Competency** - Design/select and utilize software to analyze practice and consumer information systems that can improve the delivery & quality of care	• Development of a virtual mental health screening assessment was created for

Patient Care Technology for the Improvement & Transformation of Health Care	**Competency** - Analyze and operationalize patient care technologies **Competency** - Evaluate technology regarding ethics, efficiency and accuracy **Competency** - Evaluates systems of care using health information technologies	this project called the Farm Stress Screener. • Utilized a virtual mental health self-assessment which aided in evaluating and analyzing participant responses. • Collected demographical data during registration which allowed participant responses to be trended and utilized health informatics. • Evaluated systems of care by using technologies designed to improve participant health. • Evaluated ethical considerations by maintaining patient privacy and confidentiality, as well as ensuring efficacy and accuracy of assessment.
	Description	**Demonstration of Knowledge**
Essential V ***Health Care Policy of Advocacy in Health Care***	**Competency**- Analyzes health policy from the perspective of patients, nursing and other stakeholders **Competency** – Provides leadership in developing and implementing health policy **Competency** –Influences policymakers, formally and informally, in local and global settings **Competency** – Educates stakeholders regarding policy **Competency** – Advocates for nursing within the policy arena **Competency**- Participates in policy agendas that assist with finance, regulation and health care delivery **Competency** – Advocates for equitable and ethical health care	• Identified mental health concern among farmers related to stressors and other situational factors. • Advocated for and raised awareness, provided improvement of current mental health screening among this group by developing the Farm Stress Screener. • Educated participants about available resources and the health disparity among farmers and related occupations. • Sustainability of a continued Farm Stress Screener for future practice.
Essential VI ***Interprofessional***	**Competency**- Uses effective collaboration and communication to develop and implement	• Professional collaboration between NCAI, site

Collaboration for Improving Patient & Population Health Outcomes	practice, policy, standards of care, and scholarship **Competency** – Provide leadership to interprofessional care teams **Competency** – Consult intraprofessionally and interprofessionally to develop systems of care in complex settings	champion, faculty, and participants. • Implemented change in practice by utilizing a virtual self-assessment to identify mental health disparities among farmers and other associated occupations. • Developed a system of care through utilizing a virtual self-assessment screening program (FSS) to identify and direct participants to resources in a timely manner.
Essential VII ***Clinical Prevention & Population Health for Improving the Nation's Health***	**Competency**- Integrates epidemiology, biostatistics, and data to facilitate individual and population health care delivery **Competency** – Synthesizes information & cultural competency to develop & use health promotion/disease prevention strategies to address gaps in care **Competency** – Evaluates and implements change strategies of models of health care delivery to improve quality and address diversity	• Identified a target population who are at risk for mental health disparities and utilized a FSS to improve their health by providing resources. • Addressed gap in care, as farmers often lack time to seek care. Created a virtual self-assessment to provide resources to this special population. • Changed current strategy of mental health self-assessment and utilized a virtual model.
Essential VIII ***Advanced Nursing Practice***	**Competency**- Melds diversity & cultural sensitivity to conduct systematic assessment of health parameters in varied settings **Competency** – Design, implement & evaluate nursing interventions to promote quality **Competency** – Develop & maintain patient relationships **Competency** –Demonstrate advanced clinical judgment and systematic thoughts to improve patient outcomes **Competency** – Mentor and support fellow nurses	• Designed an intervention to help improve and promote resources toward farmers and other related occupations. • Created patient relationships through assignment with different programs using the FSS. • Tracked outcomes of data weekly to provide analysis of current method of FSS. • Provided support for individuals who were able

	Competency- Provide support for individuals and systems experiencing change and transitions **Competency** –Use systems analysis to evaluate practice efficiency, care delivery, fiscal responsibility, ethical responsibility, and quality outcomes measures	to be contacted using the FSS. • Identified responsibility of participant responses by including formal consent and disclosure agreement. Also providing resources for participants at the end of question process.