

Refining Practice Standards Targeting Mental Health Disorders in Agricultural Settings

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Abstract

Agriculture, including farming, fishing, and logging, is one of North Carolina's major industries. Workers in North Carolina's agriculture setting are facing increasing stressors that can contribute to a mental health crisis. Ensuring that agriculture workers struggling with mental health receive adequate and appropriate assistance begins with effective screening and detection. A quality improvement project was created to refine an original Farm Stress Screener to increase participation and improve follow-up communication. Recruitment for participation in the screening process occurred virtually and in person with alternative access to the registration process through scanning a QR code or navigating to a specific link. Personal information was collected during registration to ensure adequate follow-up communication. Participants received weekly mental health screenings. Positive screenings required follow-up communication to determine the proper resources for each case. The revised enrollment process eliminated follow-up communication issues from the previous Farm Stress Screener; however, overall enrollment decreased in comparison to the earlier version.

Keywords: agriculture, farming, mental health resources, Farm Stress Screener 2022, mental health screening, depression

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Section I. Introduction

Background

Agriculture in North Carolina is a 92.7 billion dollar industry that employs approximately 17% of the state's workforce (Moore, 2020). Agriculture workers face an intense work environment due to external and often uncontrollable factors, including weather, fluctuations in market prices, and most recently, the COVID-19 pandemic. The mental health of farmworkers is often negatively impacted by these uncontrollable factors, especially as these individuals continue to work through increasingly problematic conditions. One threat to the mental health of farmers is depression. Major depressive disorders are more common among farm populations than in other occupations (Rosman, n.d.). Currently, the true percentage of the agricultural population with untreated depression is unknown. Therefore, it is essential to screen agricultural workers for these conditions accurately to identify individuals at risk and refer them for further treatment to prevent deterioration of their mental health status.

Organizational Needs Statement

The selected project site works with multiple organizations to identify and address health and safety risks facing individuals within agricultural communities in North Carolina (North Carolina Agromedicine Institute, 2021). The site began utilizing a depression screening tool for farmworkers in 2020 that was developed by a previous DNP-FNP student (see Appendix A) (R. Tutor-Marcom, personal communication, June 10, 2021). This tool allowed farm workers to self-report signs and symptoms of depression every week. Specific answers on the screening tool triggered a phone call from a project site nurse to discuss signs and symptoms of depression and refer the farmer for treatment if necessary.

After one implementation period, an evaluation of the original depression screening tool revealed gaps in the data collection process. One gap noted is that farmworkers did not widely utilize the screening tool (R. Tutor-Marcom, personal communication, June 10, 2021). Increasing the utilization rate would benefit the community by appropriately identifying farmers at risk for depression. Further evaluation of the depression screening tool revealed issues regarding the follow-up process. For example, one participant's answers to some questions indicated an increased risk of emotional distress. Still, after multiple project site attempts, nurses could not connect to the individual of concern due to follow-up communication failure. Finally, patient privacy was difficult to maintain once the screening tool scored positively and was flagged for follow-up. Revising the enrollment and follow-up process would ensure the confidentiality of farmworkers who utilize the screening tool. The project site has determined that modifying the screening tool is necessary to continue providing depression screening services to farmworkers.

The Office of Disease Prevention and Health Promotion recently released the Healthy People 2030 guidelines which include a mental health aim to increase the percentage of adults with depression who receive treatment from 64.8% to 69.5% (Office of Disease Prevention and Health Promotion [ODPHP], n.d.). By revising the depression screening tool, the project site hopes to ensure the proper screening, evaluation, and treatment of farmworkers at risk for depression. Individualized screenings and appropriate follow-up with participants who screen positive on the depression screening align with the "Triple Aim" for healthcare improvement by improving patient care experience through early identification and interventions for agricultural workers at risk for depression.

The goal of the Triple Aim initiative includes improving the patient care experience, improving the health of populations, and lowering the per-capita cost of healthcare (Stiefel &

Nolan, 2012). Revising and increasing utilization of the depression screening tool improves the patient care experience by providing questions that gather appropriate data. Creating mechanisms for ensuring the individual's privacy and strengthening the follow-up communication will enhance the patient experience. Expanding utilization of the depression screening tool will positively impact the overall health of the farmworker population by promoting accurate identification of depression and the utilization of early interventions. The mental health of the farmworker population will be positively impacted through a broadening exposure to the depression screening tool. Exposure to the tool will ensure the screening of a significant portion of North Carolina farmers so that timely interventions are provided as intended. Broadened distribution and proper use of this depression screening tool could help lower the per-capita cost of healthcare by identifying individuals who would benefit from early intervention and providing the farm worker with low-cost resources as the first step in treating depression.

Problem Statement

The depression screening tool currently utilized by the project site requires revision to solidify privacy and confidentiality, and increase utilization throughout North Carolina's agriculture community.

Purpose Statement

The purpose of the DNP project with the project site is to refine and improve the current depression screening tool to enhance the privacy and confidentiality of individuals utilizing the screening tool, and promote greater access to and utilization of the screening tool.

Section II. Evidence

Literature Review

A rigorous literature review was performed on farmers, agriculture, mental health, screening tools, and current recommendations. This search utilized the PubMed and PROQUEST databases. When searching PubMed, the terms "mental health AND farmer" were used and provided 735 results. Inclusion criteria included publication within the last five years, full text available, and evidence level IV and above. Exclusion criteria included studies focused on mental health issues other than depression and projects focused on different geographic areas. The narrowed search provided ten results that were reviewed, of which two were read in entirety and determined to be appropriate for the project. The PROQUEST database was also searched using the terms "mental health AND farmer". This search resulted in 13,073 studies. Inclusion criteria were publications within the last five years, full text available, evidence-based articles, and English language. These filters provided 212 results. Studies were reviewed for appropriate content. One study was deemed suitable for inclusion. Excluded articles included those that did not pertain directly to the topic of the project and those with levels of evidence less than IV. The PubMed database was utilized again with the keywords "screening tool AND mental health". This search resulted in 3242 studies. After inclusion criteria of a five-year limit, full text available, and systemic review, 193 results remained. Exclusion criteria included topics unrelated to depression and mental health. After skimming through the articles, three studies were read in their entirety and deemed appropriate for this project.

Due to limited evidence-based research studies on this topic, the literature search continued with the APA PsycInfo and PROQUEST databases to garner additional support for this project's interventions. These were searched utilizing several terms such as "farmer AND

depression", "farmer AND depression screening", "mental health AND screening tool", and "farmer AND suicide prevention". Inclusion criteria of studies were publications published within the last five years, full text available, and evidence-based articles or quantitative studies. Three additional studies were retained from these searches to provide project support.

Current State of Knowledge

A review of current literature reveals limited information directly addressing farmworkers and mental healthcare screenings. Existing literature focuses on the job's impact on the agricultural worker's mental health but not specifically on screenings for mental health disorders. Another theme revealed during this literature review relates to the underutilization of mental health care screening tools. There are no specific guidelines or best practice recommendations for mental health disorders or depression targeting agricultural workers found during the literature search and review.

Farmers experiencing mental health problems could have a devastating impact worldwide through decreased economic productivity, poor health of farm animals, and poor human health (Hagen et al., 2019). Early interventions to prevent mental health deterioration are essential for individuals with severe mental illness (Lawes-Wickwar, McBain & Mulligan, 2018). A lack of depression screening tools geared toward farmers is problematic because farmers are at high risk for depression and suicide, which might be related to several factors such as pesticide illness or poisoning, stress, health problems or injuries, or financial issues (Reed & Claunch, 2020). The impact of these stressors can manifest in several different ways. Farmers may have less interest in pleasure, trouble concentrating, loss of appetite or weight change, become tired or irritable, have difficulty sleeping, and feel a loss of control and anxiety (Daghagh Yazd, Wheeler & Zuo, 2019).

The onset of Major Depressive Disorder can be prevented or delayed through psychological interventions aimed at those individuals considered to have increased risk or subclinical symptoms of depression (Freund et al., 2020). The goal of screening tools is to help detect individuals experiencing depression and begin implementing early interventions. These screenings can "improve quality of life, help contain health care costs, and reduce complications from co-occurring behavioral health and medical comorbidities" (Mulvaney-Day et al., 2017, p.335). Successful depression screening tools require a structured, validated tool and must consider the population being screened.

Current Approaches to Solving Population Problem

The project site currently manages two programs named Farmer to Farmer and Tape and Twine that address mental health issues of North Carolina farmers. The Farmer to Farmer program allows farmers and farm family members to support one another during difficult times. The individuals involved in this program have received special training in peer support (North Carolina Agromedicine Institute, 2021). This program's goal aligns with evidence indicating that social support may decrease depression (Alterman et al., 2018). The Tape & Twine program raises awareness of depression and anxiety by promoting education related to agricultural stressors, the signs and symptoms of stress-related illnesses like depression and anxiety, and ways to help reduce stress (North Carolina Agromedicine Institute, 2021). Increasing awareness through the Tape & Twine program reflects current trends showing an increased focus on the mental health of farmers worldwide (Daghagh Yazd, Wheeler & Zuo, 2019). The project site has previously utilized a remote electronic depression screening tool to screen farmers for depression and connect them with these various programs and supports. Ensuring that the required

technology is available and reliable is essential for implementing electronic mental health services (Vis et al., 2028).

Evidence to Support the Intervention

Following a discussion with the site, it is likely that increasing farmer participation and improving confidentiality for follow-up communications could improve the current depression screening tool. Increasing participation is essential for providing preventative interventions to a large population sample (Braun et al., 2019). Specifically, internet-based interventions aimed at preventive health care for professions such as farming can have a positive effect as long as the intervention is accepted and utilized by the population of focus (Braun et al., 2019). Farmer participation could be increased through the utilization of convenient SMS text messaging. Research by Jin and Wu concluded that depression screenings conducted using a PHQ-8 scale through SMS text messaging were consistent, reliable, and in harmony with the gold standard assessment (2020). Other evidence suggests that collaboration with professional institutions, increasing public awareness of mental disorders, and increasing public awareness of the benefits of telehealth services might be beneficial to increasing participation in telehealth-based interventions like the depression screening tool (Freund et al., 2020). Using this evidence-based guidance and collaborating with various NC farming organizations such as the project site, the North Carolina Growers Association, and the North Carolina Farm Bureau is imperative.

While evaluating the strengths and limitations of the current depression screening tool is essential, it is also apparent that confidentiality and providing follow-up care need to be addressed. To maintain user privacy, the current screening does not allow users to enter any identifying information during the registration process. This created a problematic situation when the project site nurses began following up with positive screenings. Farmers entered the farm

phone number for contact purposes during the registration process. Without any specific information, like a first name, it was challenging to maintain the confidentiality of the individuals completing the depression screening tool. Research from Ni, Li, Hui, McDowell, and Leung demonstrated that requesting a unique identifier for individuals did not affect overall consent (2017). Having participants include a first name or another identifier when signing up for the depression screening tool will maintain privacy during follow-up phone calls by ensuring that the project site nurses speak directly to the farmer that completed the depression screening tool.

Evidence-Based Practice Framework

This project focuses on refining the depression screening tool to increase utilization, privacy, and confidentiality with farmers as the target user. Well-known nursing theorist, Nola J. Pender, created a middle-range integrative theory employing a change model consisting of three categories: unique characteristics and experiences of the population or individual, behavior-specific cognitions and affect, and behavioral outcomes (Butts & Rich, 2018). This DNP project will target the three major categories within Pender's health promotion model to increase North Carolina farmers' well-being, focusing on mental health.

The project will address Pender's first category of the health promotion model, unique characteristics and experiences, by targeting a distinct group of individuals: North Carolina farmers and farm family members. Tailoring distribution of the depression screening tool program to farmers associated with the project site, the North Carolina Growers Association, and the North Carolina Farm Bureau is the first step of the process. The second category of Pender's model, behavior-specific cognition and affect, can be addressed in this project through interpersonal influences, including family, peers, healthcare providers, and perceived social

norms. When participants screen positive on the depression screening tool, they are contacted by a nurse from the project site for further evaluation and connection with available peer support programs and resources in the community. The third category of Pender's health promotion model focuses on behavioral outcomes, which will be addressed by the results of the individual participant behavioral interventions that occurred throughout the depression screening tool process.

Ethical Consideration & Protection of Human Subjects

Privacy and confidentiality are of utmost concern regarding each individual participating in the depression screening tool project. Information collected through the execution of this project will be used with honorable intentions to keep the participant's best interests in mind and collect information regarding the mental health status of North Carolina farmers and farm family members. This project is equal and equitable to each individual within the target population of North Carolina farmers because the depression screening tool will be available to all ages, genders, races, ethnicities, and abilities. There is no perceived potential harm to the population of interest. Individuals will not be taken advantage of as the possible outcomes of the depression screening tool intervention are the provision of resources to promote mental health awareness and available resources.

In preparation for the project, Collaborative Institutional Training Initiative (CITI) modules were completed to gain more information regarding social and behavioral research ethics. East Carolina University's Medical Center Institutional Review Board (UMCIRB) granted this DNP project's Institutional Review Board (IRB) approval (See Appendix B). A formal IRB approval is in place for this project with an Exempt status.

Section III. Project Design

Project Site and Population

The selected project site is devoted to improving the health of farmers, fishers, foresters, farmworkers, and families in North Carolina. These improvements are facilitated through various research, prevention, interventions, education, and outreach programs. The population targeted in this project were farmers residing in North Carolina. The lifestyle and daily schedules of farmers can change drastically from day to day and season to season due to the nature of agriculture work. The self-administered survey benefited the individuals as they could fit it into their schedules throughout their busy days. Another benefit to the self-administered nature of the survey was the ability for the farmer to ensure their comfort and privacy by taking the survey when they were in a private location. One barrier to the survey process is the requirement for an internet connection. Many rural areas do not have reliable internet access, which could hinder the completion of the depression screening.

Description of the Setting

The project was facilitated in a remote capacity via private and online communication. The operations center of the site is located in Greenville, North Carolina. In addition to this operational hub, the site operates throughout the agricultural communities in all regions of North Carolina. Communication between the partner site and participants was accomplished through survey distribution to the farmer's private email address provided during registration. Promoting the depression screening tool was also achieved through the project site's facebook pages. It was also promoted through the Farm Bureau and users of the project site's Farmer to Farmer program. The project was also advertised through the site at the Farm Show in Raleigh, North Carolina, on February 2-4, 2022. The virtual platform utilized for survey and data collection was

Research Electronic Data Capture (REDCap), an organization that creates databases and surveys that are secure and HIPPA compliant. The survey could be completed in the comfort of the farmer's home, while at work, or virtually anywhere there was an internet connection. If necessary, a project site nurse would follow up with individual farmers remotely through a telephone call to the number provided when registering for the depression screening project. The farmer was not required to travel to a specific location to participate in the project at any time.

Description of the Population

The population involved in the project were farmers, farmworkers, fishers, loggers, and farm family members of North Carolina affiliated with the project site. According to the 2017 Census of Agriculture, there are 74,062 producers in North Carolina, of which 64.7% are male, and 35.3% are female (USDA, 2017). The vast majority of producers in North Carolina are white, and over half of producers in North Carolina are between the ages of 35 and 71 (USDA, 2017). Depression screening registration was not limited to any specific geographical region within the state. Information regarding the county of farm location, age, and gender of individuals were collected during sign-up to understand better the population of individuals associated with the project.

Project Team

The project team consisted of multiple individuals, including a Doctor of Nursing Practice- Family Nurse Practitioner student, the site champion within the project site, and the East Carolina University (ECU) faculty and information technology (IT) department. The DNP-FNP student served as Principal Investigator (PI) of the project and was responsible for research, implementation of evidence-based changes, data collection and processing, and dissemination of findings. The site champion within the project site serves as the director and Agromedicine

Extension Specialist. Two nurses on staff at the site have specialty Agrisafe training. These nurses were involved with the project by responding to positive screenings with a follow-up phone call to individual farmers. East Carolina University (ECU) faculty were responsible for continued communication and follow-up with the PI. The ECU IT department was instrumental in assisting with the development of the survey, comprehensive REDCaps training, and follow-up support with IT issues throughout the project.

Project Goals and Outcome Measures

The project's first goal was to increase utilization rates of the Farm Stress Screener tool among North Carolina agricultural workers. Increased utilization would raise awareness of and increase access to the programs and resources available to the agriculture community through the project site. The second goal of this project was to address a privacy concern regarding follow-up communications discovered during the review of the original Farm Stress Screening Tool project. The project approval process began by obtaining a commitment of support from the site champion. The ECU Institutional Review Board (IRB) approved the DNP project, which was deemed a quality improvement project. Surveys and reminder emails were created and distributed through the REDCap program, and data collection was logged using Microsoft Excel spreadsheets. After 12 weeks of implementation, data analysis began. Specific data points of interest were trends relating to the farm's geographic location, farmer's age and gender, and utilization rates of the revised Farm Stress Screener. Any follow-up action or referral by the project site regarding positive screenings were recorded. The project's anticipated outcome was that farmers and related individuals would complete the self-assessment screening tool and understand the available support services and programs.

Description of the Methods and Measurement

A graphic advertisement was created to increase enrollment and participation in depression screening (Appendix C). The project site posted information about the Farm Stress Screener 2022 to the project site's Facebook and Instagram social media accounts to disseminate information to followers of these social media pages. This information was also presented and distributed in person at the Southern Farm Show in Raleigh, NC on February 2-4, 2022 and at the North Carolina Farm Bureau Conference on February 5, 2022. Interested participants had to review the consent form to continue with registration by scanning the associated QR code or following the provided link. Enrollment included entering personal and demographic information, including their email address, name, and phone number, ensuring successful follow-up contact by site nurses if necessary. Every week for 12 weeks, the participant received an email or SMS text message with a link or QR code created through the REDCaps program. Following this link or QR code took the participant to a new Farm Stress Screener weekly, where participants could select the answers that reflected how they were doing each week. If the participant selected "yes" to at least two of the questions on the revised Farm Stress Screener, a follow-up phone call was attempted by the site nurse to speak with the participant. The purpose of this follow-up was to gather more information and refer to programs or services that may benefit the individual. The site nurse working with the project maintained a confidential log of participants' names, email addresses, phone numbers, and the resulting program or service to which a referral was made.

During the project implementation period, data collected consisted of demographical information provided during participant sign-ups. Participants' occupations, geographic location of their farm, age range, and gender were collected and utilized for data analysis. Each

participant's responses were logged to visualize any trends that may have developed over the implementation period and assess response to any interventions provided by the site nurses.

Discussion of the Data Collection Process

Survey data collection was processed and recorded through REDCap and Microsoft Excel spreadsheets. When participants enrolled in the project, the REDCap software assigned each individual a private and secure link to access their surveys. Demographic information obtained during registration was associated with each individual's survey responses. Participants received a weekly email through REDCap with a link to access the survey. An automatic reminder email was sent if a participant did not respond within 48 hours. The data was collected and logged once the participant responded to all questions on the revised Farm Stress Screener tool. Careful collection and logging of information enabled the assessment of each participant's responses over the entire 12-week implementation period. If a participant's screening was positive, as indicated by a score of two "true" responses, a referral was generated for the site nurse to contact the individual for further assessments and provide information about appropriate interventions or available resources. All of this data was gathered and logged to assess the utilization rates of the Farm Stress Screener and the effect on increasing awareness of current project site programs relating to mental health. Data collection and logging also helped determine if changes to the registration process have made follow-up procedures more effective.

Implementation Plan

The project was implemented over 12 weeks between February and May of 2022. Participants that volunteered to enroll in the depression screening tool study agreed to receive weekly emails to complete the survey. The REDCap system autogenerated an email weekly at 0730 on Tuesday mornings. This email prompted the participants to click a link that took them to

a page to complete the Farm Stress Screener. Upon completion of the survey, participants were redirected to a webpage showcasing the various programs providing support to the agricultural community offered by the project site. Data collected during the implementation period was used to evaluate this project's changes to the original Farm Stress Screener recruitment and registration processes.

Timeline

In collaboration with the ECU IT department and the project site, a modified version of the original Farm Stress Screener was created in the Fall of 2021. The project advertisement flyer was created using a QR code and a link to the project webpage. The project was advertised, and participants were recruited in early February of 2022. Implementation of the project began in February 2022 and ran 12 weeks through May 2022 (see Appendix D). At the end of the 12-week implementation period, the collected data was analyzed to provide more information regarding the changes to the original Farm Stress Screener. In July 2022, after the results were analyzed, a formal paper was written and a presentation showcased the results of this DNP project.

Section IV. Results and Findings

Results

A total of five participants enrolled in the Farm Stress Screener during this implementation period. Of these five individuals, four identified themselves as female, and one as male, as shown in Figure 1. The participants were between 30 and 59 years old (See Figure 2). All of the participants selected farming as their occupation upon enrollment. North Carolina counties represented by the participants included Johnston, Lincoln, Alamance, and Polk. There were 31 responses to the weekly Farm Stress Screener throughout the implementation period: five positive and 26 negative results, as shown in Figure 3. Project site nurses denied difficulty contacting the individual with positive results. Follow-up information provided to this farmer included information regarding the site's farmer-to-farmer peer support program and the national suicide hotline phone number.

Figure 1

Enrollment by Gender- Farm Stress Screener 2022

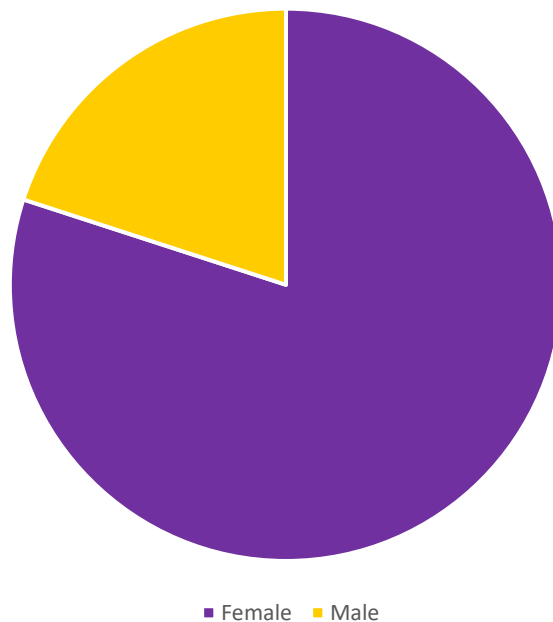


Figure 2

Age of Participants Upon Enrollment

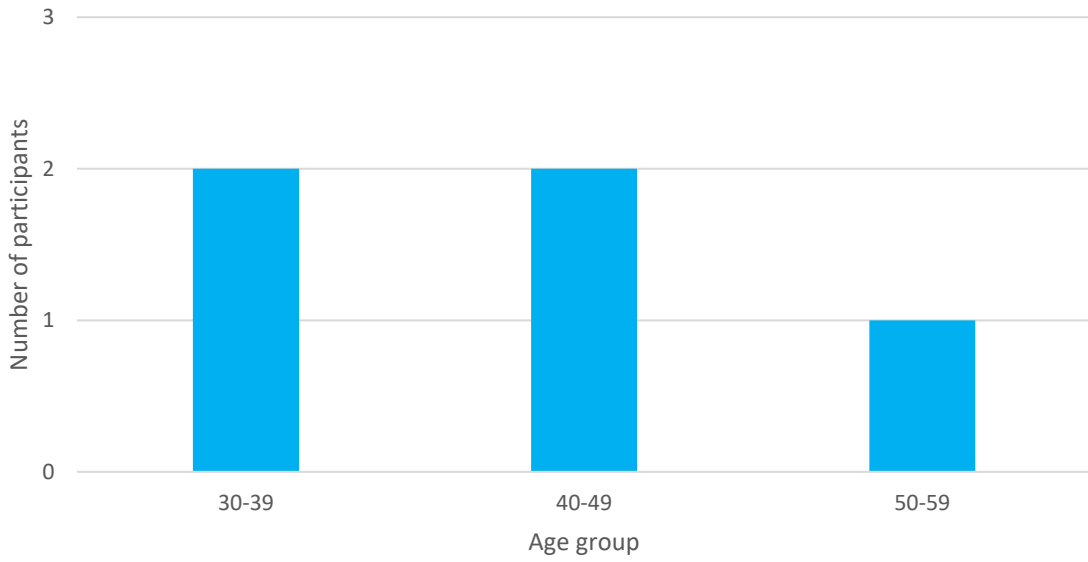
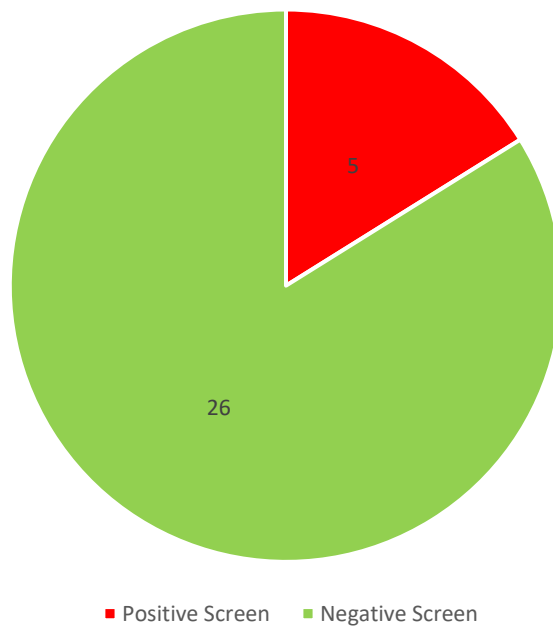


Figure 3

Screening Results



Discussion of Major Findings

The literature search revealed minimal information regarding mental health screenings specific to the agricultural population. Ni et al. (2017) suggested that requesting a unique personal identifier for screenings does not affect overall consent for screening; however, enrollment in the Farm Stress Screener dropped dramatically from 20 participants in the original screener to 5 participants with the modified mental health screening tool that included a first name identifier. On the same note, the project site nurses did not report difficulty identifying and contacting positive screenings with the updated tool, which included the first name identifier.

Braun et al. state that internet-based preventative healthcare interventions can have a positive effect as long as the interventions are accepted and utilized by the population (2019). Since the population of focus resided in rural areas, and the screening required an internet connection to complete, this could have accounted for a decreased enrollment due to poor internet access and lack of exposure to survey enrollment advertisements. Another unexpected finding was that participants did not opt for SMS text messaging to utilize the weekly screening. According to research by Jin and Wu, depression screenings conducted through SMS text messaging using a PHQ-8 scale were both consistent and reliable (2020). While the participants did not opt for the SMS text messaging option, the results of the Farm Stress Screener may have been consistent and reliable through their email option.

Section V. Interpretation and Implications

Costs and Resource Management

Actual financial costs for the revised Farm Stress Screener 2022 were minimal. This year, there was no additional associated fee since the project was already in place with RedCap through the original Farm Stress Screener. The initial cost of the original project setup was \$435.00 in 2021. The sole actual monetary expense incurred for the current, refined project was \$165. This expense was incurred by printing 250 handout flyers that included a link and QR code to scan for individuals to complete enrollment in the project.

Since the project utilized student labor, the daily work associated with the Farm Stress Screener was of no cost to the project site. The daily tasks for this project included checking the RedCap data dashboard, collecting recorded data, entering data into the collection log, and making appropriate contact with the site. This time totaled to approximately one hour per day. The cost would have dramatically increased if the project site had utilized paid nursing staff to complete the creation and implementation. Twenty-eight hours were spent redesigning the RedCap enrollment and survey site. Twenty-seven hours were spent advertising the program at the Southern Farm Show, and 52 hours were spent collecting survey data and adding information to the collection log. An estimated pay rate of \$35 per hour would have created a cost of \$3,745 for labor, bringing the project total to \$3,910 (see Appendix E). Manual entry of data into the collection log was time-intensive. Time could easily be saved by having automatic notification delivered to the site nurse email with new enrollments and positive screenings. If a student did not complete the laborious tasks, the project site nurses would have to prioritize their current workload and put other jobs on hold to accomplish screening results and follow-up phone calls. These additional tasks could potentially incur additional payroll costs for the site. Overall, the

changes implemented to this project would not be supported by the results in a financial sense. During the implementation phase, one farmer had five positive screenings. The site nurse successfully made contact with the individual, but the farmer abruptly ended the call in a very short amount of time. The site nurse then sent farmers' resources via the email provided during sign-up. It is unclear if the farmer was able to utilize those resources provided during the intervention of the project site nurse. However, if that farmer had taken action based on information provided through this project, even one life saved would have been worth the cost and labor of the project.

Implications of the Findings

Implications for Patients

Privacy is a significant consideration for participation in the Farm Stress Screener project. Overall, the process of the screening implementation created a sense of privacy through remote screening. Participants did not have to travel to any location or have face-to-face encounters with staff to utilize the screener. Enrollment in the project required a first name associated with the patient demographics and contact information to facilitate enhanced follow-up contact. The additional requirement to submit the first name could have hindered participation due to farmer privacy concerns.

Another consideration for the participants included the timing of participation. While the weekly screening email was automatically sent to participants at the same time each week, the participants could complete the screener at any time that was convenient for them. The survey could be conducted from a fixed location or could have been completed on a mobile electronic device with internet access. The screener only consisted of four questions, allowing the participant to complete the screener quickly.

This project also raised awareness about existing project site services. Upon completing the weekly survey, each participant was redirected to a web page containing information on all the site programs. With a positive screening, site nurses could contact the individual and relay information on the national suicide hotline and existing farmer-to-farmer peer support program.

Implications for nursing practice.

The nursing implications included improved ability to connect with individuals and utilizing patient input to identify their needs. Changes to the original Farm Stress Screener to include adding the first name at enrollment improved previous follow-up issues. This additional requirement removed ambiguity and allowed nurses to positively identify the individual at follow-up. Patient self-reflection on screening questions also assisted nurses in identifying individuals who required follow-up and further assistance. Using this self-reflection is beneficial to assist medical staff in time management decisions and allocating resources to produce the most significant impact for individuals participating in the mental health screener.

Impact for Healthcare System(s)

This project could give healthcare systems insight into virtual and remote screenings. These screenings can be helpful to healthcare systems by helping to identify individuals who may need specialty services. Results from this project may also indicate that older individuals may not be as responsive to technology as younger individuals or that older individuals may not be as forthcoming regarding a mental health or stress-related issue. Healthcare systems can also improve follow-up care and communication by obtaining more specific patient information during enrollment in the virtual and remote screenings. These changes may allow for greater utilization of specialty services as needed.

Sustainability

This project could be sustainable with modifications to allow for rolling enrollment and automated result notifications. If participants enroll in the survey and utilize the SMS format, responses could take less time than using a desktop computer to retrieve an email and redirect to a website to complete the Farm Stress Screener survey. Positive responses could also be automatically sent to a project site nurse immediately upon submission through email or SMS, allowing for decreased response and follow-up time. These changes would provide the farmer with assistance in a more timely manner.

Dissemination Plan

A poster showcasing this project was created and will be presented at East Carolina University College of Nursing on July 12, 2022 (see Appendix F). The project will also be submitted to an online digital repository for East Carolina University, *The Scholarship*. Project information will also be showcased through project site's social media platforms upon graduation of the DNP student.

Section VI. Conclusion

Limitations and Facilitators

Upon reflection of the implementation period of the revised Farm Stress Screener, there appear to be several limitations and facilitators to the project. Upon initial research, information regarding mental health screenings specific to agricultural populations was severely limited. As widespread awareness of mental health issues increases, the stigma surrounding mental health issues and the agricultural community is changing. This stigma may have inhibited participation in the project. Facilitators of the project included the ability to distribute materials in-person at the Southern Farm Show. The in-person disbursement of information may have helped reach less technologically advanced individuals. Another project facilitator included the automated distribution of electronic surveys through the RedCap platform. This automation ensured the timely distribution of weekly emails. RedCap also saves survey data, facilitating data collection, sorting, and storage.

Recommendations for Others

This project has had success in eliminating follow-up communication errors as expected. However, after making these changes to the enrollment process, the overall enrollment in the mental health screener decreased dramatically. Enrollment may have declined due to several independent factors related to the reality of the life of agricultural workers. Utilizing an automated system for survey distribution is one of the greatest facilitators of this type of project. For individuals interested in completing this project on a larger scale, it would be beneficial to utilize survey production software to track screening results automatically. This project could also be conducted on a broader scale to include other geographic locations or different populations. To support sustainability for this project, the project could be modified into an

ongoing survey that continues throughout the year. This modification could encourage enrollment and participation as individuals discover the Farm Stress Screener, which can be completed as the participant's schedule allows.

Recommendations Further Study

Further study would be beneficial to this project. Inquiring with past or current participants regarding where they found out about the program would help assess which promotions were most effective. It would also be beneficial to find out if these participants were hesitant to enroll in the program due to any changes in the consent, including adding their first name. Another recommendation will be to determine if the easing of COVID-related restrictions affected the decreased participation from the previous year. The Farm Stress Screener could be replicated through other states' Farm Bureaus or other agricultural service departments to help address mental health in the farming population in other areas of the country. Other professions or special populations of interest could also utilize this type of remote screening.

Final Thoughts

North Carolina is home to many agricultural workers, including farmers, fishermen, and loggers. The agricultural workforce faces many stressors that can exacerbate mental health conditions. Awareness of mental health-related struggles is on the rise, and programs are currently in place to assist farmers and farm families. This project aimed to increase farmer participation in weekly mental health screening and improve follow-up communications with project site staff by refining a previously developed mental health screening tool. Follow-up communication seeks to connect struggling farmers with the available programs.

Enrolled participants received 12 weekly Farm Stress Screener surveys. Participant responses were monitored and logged in a secure location. If the participant responses indicated

a heightened stress level, the project site partner initiated contact with the enrolled farmer to discuss beneficial programs. Compared to the previous year's screenings, overall participation in this project decreased. However, there were no reports of difficulty connecting with the individual with a positive screening due to changes made to enrollment. This project highlighted the need for further investigation regarding best practices for recruitment and participation in mental health screenings of individuals in the agriculture industry.

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Appendix A**Farm Stress Screener 2022**

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 adds 1 point

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

A) True

B) False

-True adds 1 point and is an automatic flag.

Scoring:

-Automatic Flag questions Question 4 lead to contact by site nurse.

-If the score is 2/4 or more, site nurse will contact participant.

(This Farm Stress Screener 2022 is an amended version of the original Farm Stress Screener)

Demographic information collected during enrollment process

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
 - (See next page)
- First name (for contact purposes)
- Email Address- (for contact purposes)
- Phone number- (for contact purposes and for text message)

Other information

-How would you like to be contacted weekly (email or text message)

-Disclosure agreement on home page

-Agreement/Consent saying that you agree to be contacted by the project site

(This Farm Stress Screener 2022 is an amended version of the original Farm Stress Screener)

NC County List

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

Wayne

Wilkes

Wilson

Yadkin

Yancey

(This Farm Stress Screener 2022 is an amended version of the original Farm Stress Screener)

Appendix B

IRB Letter of Approval



EAST CAROLINA UNIVERSITY
University & Medical Center Institutional Review Board
 4N-64 Brody Medical Sciences Building · Mail Stop 682
 600 Moye Boulevard · Greenville, NC 27834
 Office 252-744-2914 · Fax 252-744-2284
rede.ecu.edu/umcirb/

Notification of Amendment Approval

From: Social/Behavioral IRB
 To: [REDACTED]
 CC: [REDACTED]
 Date: 12/15/2021
 Re: [Ame2_UMCIRB 20-002849](#)
[UMCIRB 20-002849](#)
 Improving Mental Health Resources for Farmers

Your Amendment has been reviewed and approved using expedited review on 12/15/2021. It was the determination of the UMCIRB Chairperson (or designee) that this revision does not impact the overall risk/benefit ratio of the study and is appropriate for the population and procedures proposed.

Please note that any further changes to this approved research may not be initiated without UMCIRB review except when necessary to eliminate an apparent immediate hazard to the participant. All unanticipated problems involving risks to participants and others must be promptly reported to the UMCIRB. The investigator must adhere to all reporting requirements for this study.

If applicable, approved consent documents with the IRB approval date stamped on the document should be used to consent participants (consent documents with the IRB approval date stamp are found under the Documents tab in the study workspace).

The approval includes the following items:

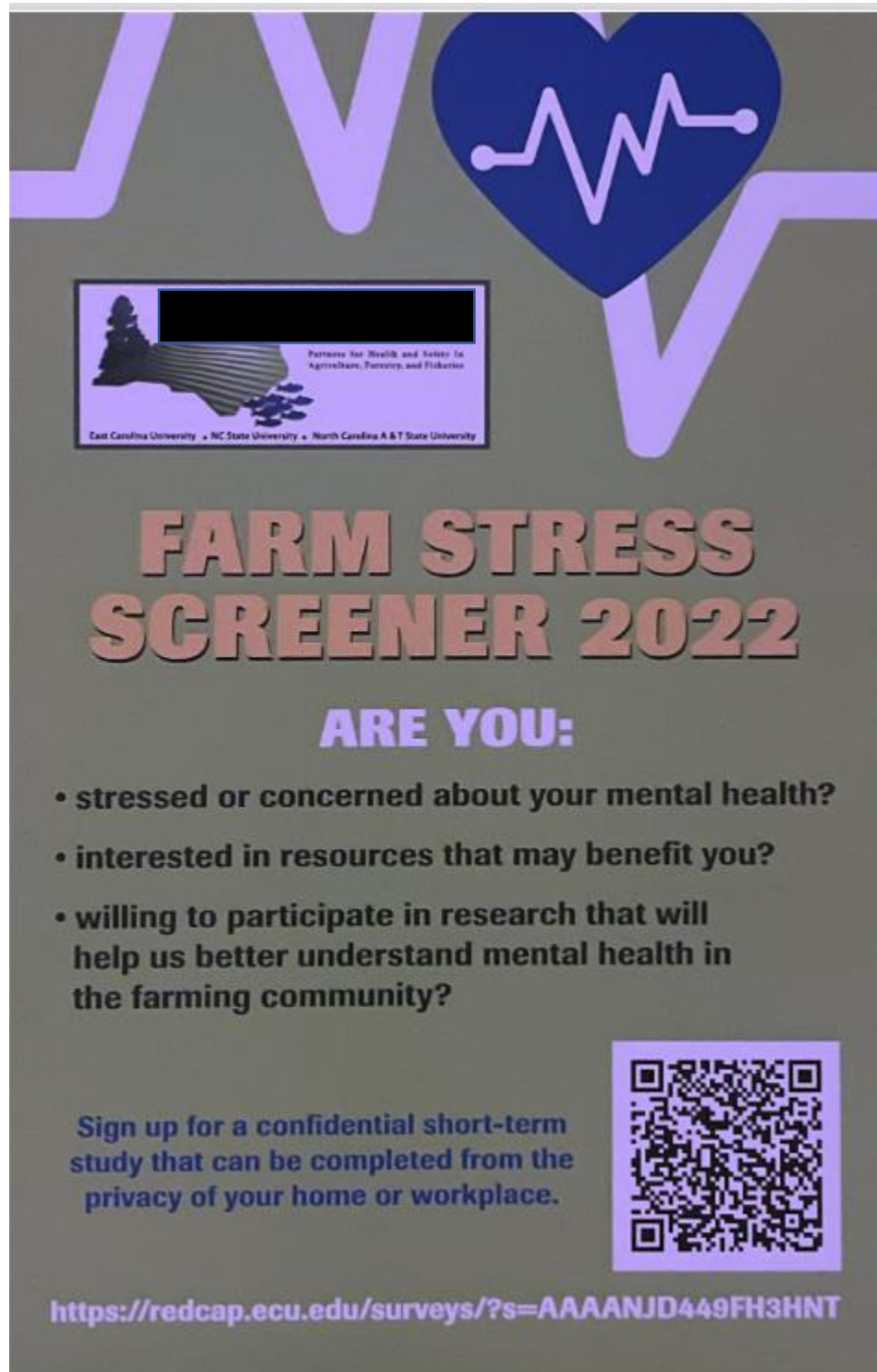
Document	Description
Advertisement(0.01)	Additional Items
Initial Farm Stress Email(0.03)	Recruitment Documents/Scripts
Recruitment flyer(0.01)	Recruitment Documents/Scripts
Revised Consent(0.01)	Consent Forms

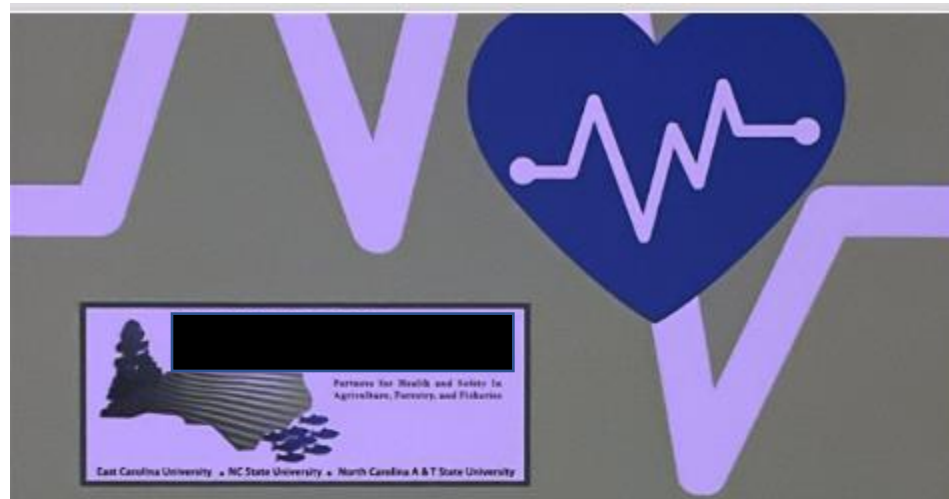
For research studies where a waiver or alteration of HIPAA Authorization has been approved, the IRB states that each of the waiver criteria in 45 CFR 164.512(i)(1)(i)(A) and (2)(i) through (v) have been met. Additionally, the elements of PHI to be collected as described in items 1 and 2 of the Application for Waiver of Authorization have been determined to be the minimal necessary for the specified research.

The Chairperson (or designee) does not have a potential for conflict of interest on this study.

Appendix C

Project Advertisement





Center for Health and Safety in
Agriculture, Forestry, and Fisheries


East Carolina University • NC State University • North Carolina A & T State University

FARM STRESS SCREENER 2022

ARE YOU:

- stressed or concerned about your mental health?
- interested in resources that may benefit you?
- willing to participate in research that will help us better understand mental health in the farming community?

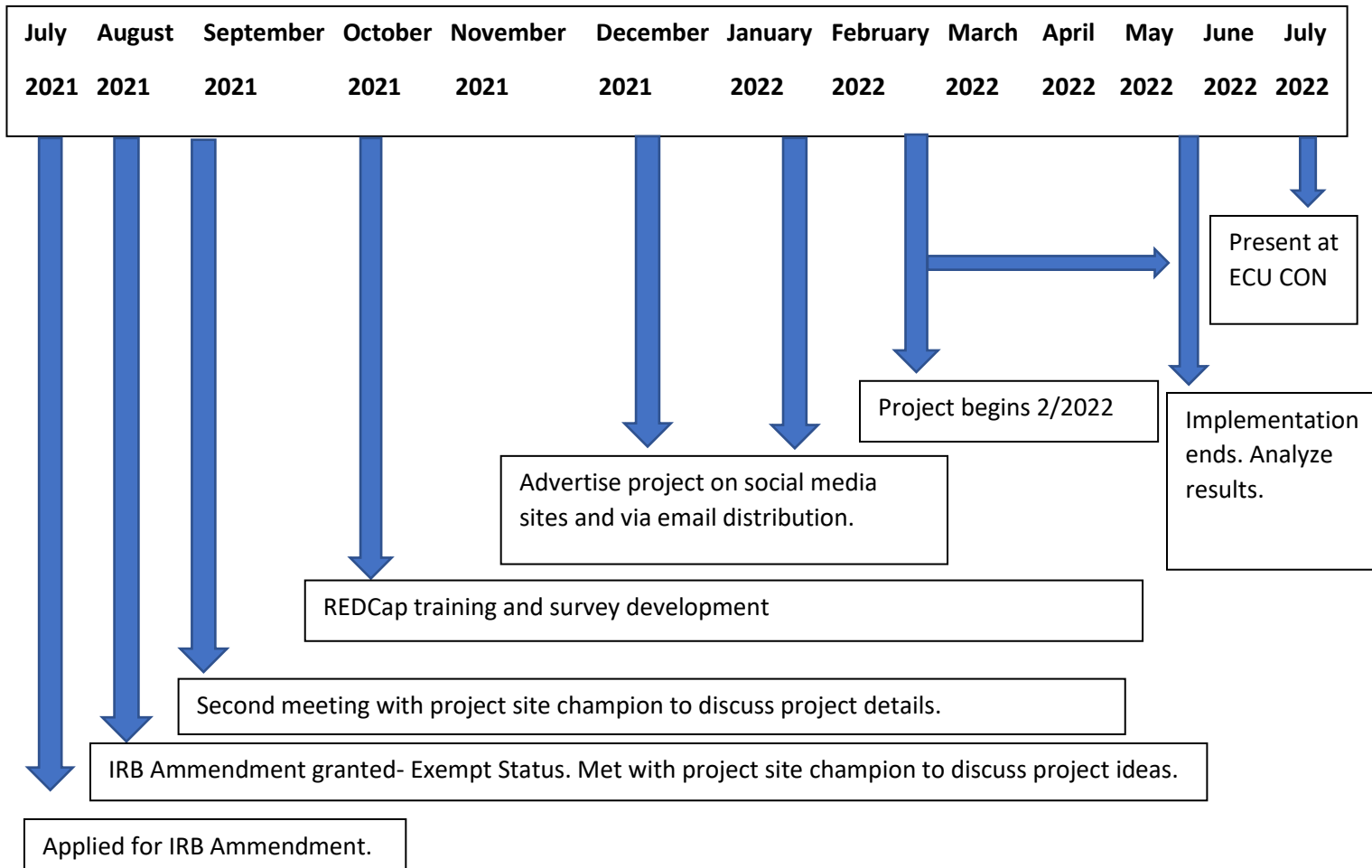
Sign up for a confidential short-term study that can be completed from the privacy of your home or workplace.



<https://redcap.ecu.edu/surveys/?s=AAAANJD449FH3HNT>

Appendix D

Timeline of Project Implementation



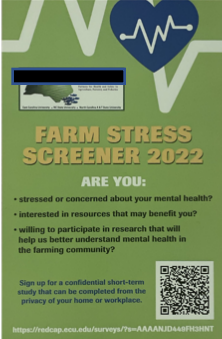
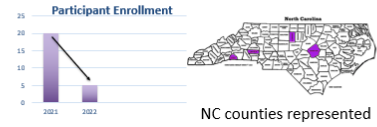
Appendix E**Project Budget**

Farm Stress Screener 2022 Project Budget			
LABOR			
	HOURS	RATE	\$ TOTAL
Refining screener and designing advertisement	28	\$35 per hour	\$980
Southern Farm Show	27	\$35 per hour	\$945
Data Collection and Follow-up phonecalls	52	\$35 per hour	\$1,820
SUPPLIES			
	QUANTITY	RATE	\$ TOTAL
Advertisement Flyer	250	Flat Fee	\$165
PROJECT TOTAL \$3,910			

Appendix F

Presentation Poster

ECU COLLEGE OF NURSING
Refining Practice Standards Targeting Mental Health Disorders in Agricultural Settings

Purpose		Barriers
<ul style="list-style-type: none"> • Increase access to and utilization of Farm Stress Screener in the agricultural population in NC • Enhance privacy and confidentiality of individuals utilizing Farm Stress Screener 		<ul style="list-style-type: none"> • Limited information specific to depression screening and agricultural population • Stigma regarding mental health still exists • Unreliable internet connection in rural areas
Problem	Outcomes	Implications to Care
<ul style="list-style-type: none"> • Agricultural population effected by outside stressors including generational conflict, financial troubles, weather, COVID19-related restrictions • Major depressive disorders more common for farming population, but exact rate is unknown • Original Farm Stress Screener tool had insufficient data collection to ensure confidential follow-up 	<ul style="list-style-type: none"> • 5 participants enrolled in Farm Stress Screener • Decrease from 20 participants in 2021 • Resolved privacy concerns from previous Screener 	<ul style="list-style-type: none"> • Increased personal information obtained at enrollment alleviates privacy concerns with mental health screening • Short survey is completed quickly and at the leisure of each participant • Promotion of existing [redacted] services to everyone who completes the mental health screening • Screenings can be adjusted for other disease processes or conditions • Greater time management and allocation of resources with automaticity of screening process
Process		<p>Project completed by: [redacted] BSN, DNP Student, RN, FNP-BC [redacted]@gmail.com</p> <p>Acknowledgements: [redacted] • ECU College of Nursing</p>