

HARVESTING HAPPINESS: A CLOSER LOOK
INTO RURAL FARMERS' MENTAL
HEALTH

by

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ABSTRACT

The current state of rural Alabama farmers' and agricultural workers' mental health was examined. To create an objective assessment, farmers and agricultural workers completed a series of established questionnaires, including: the Farm and Ranch Stress Assistance Survey, the Lubben Social Network Scale, the Brief Multidimensional Measure of Religion and Spirituality, and the Patient Health Questionnaire 9. The participants also answered open-ended questions about any changes in their life due to the COVID-19 pandemic that began in 2020. Therefore, any impacts of the COVID-19 pandemic were taken into consideration. Qualitative interviews were also conducted with rural physicians to determine the main stressors and mental health struggles that they frequently observe in their farming patients. Results suggested that age was negatively correlated with PHQ-9 scores and positively correlated with religious alignment. Education level was positively correlated with various reported stressors. The physician interviews additionally suggested that farmers commonly present with anxiety, depression, and occasionally alcoholism. The medical professionals also hypothesized that unconventional methods of intervention like after-hours clinics, farmer spouse interviews, and peer support groups may be beneficial for the mental health of this population. Additional similar research with a larger sample size would be particularly useful in better understanding the relationship between age and depression and the relationship between education level and stress in this population.

DEDICATION

My thesis is dedicated to those who feel unseen.

ACKNOWLEDGEMENTS

Throughout the entire process of designing my project, brainstorming ideas, and expressing the results of my findings, I have been given phenomenal guidance from many people. I would like to thank my committee chair, Dr. Martha Crowther, for her enthusiasm and constant reassurance throughout the past two years. Your refined expertise, your ability to help me verbalize my ideas, and your advice has all been instrumental in my success as a student, and as a person constantly trying to improve. You have an amazing ability to will success into existence, which is very rare.

I also would like to thank my committee members for their willingness to be a part of my research journey. Your patience, feedback, and continued support are the main reasons that I have been able to gain so much meaning and newfound understanding from my experience conducting this study. Research is the ultimate group project, and I am so lucky to have had an amazing group to work with.

Finally, I want to show my appreciation for my parents. From countless hours listening to my ideas about my project, to time spent encouraging me to do everything to the best of my ability, I owe so much to you two. You give me the courage to tackle any task given to me and to strive to create projects that have real meaning to myself and others. I learned all that I know about compassion from you and your love for me, so I hope you know that my work about farmers' mental health reflects your care for others.

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INTRODUCTION

Rural farmers experience a difficult and extremely unique way of life. They are subject to environment-specific, culture-specific, and circumstance-specific stressors. These chronic stressors can lead to long-term mental health issues. Studying Alabama farming stressors in depth is the only evidence-based way to create innovative interventions to improve this population's mental health. More can be done to make rural farmers feel comfortable discussing and seeking help for their mental health issues, no matter what form the process may take. Therefore, taking a blind approach in regard to the mental health needs of these rural farmers is not productive; I felt that conducting a systematic study with the eventual goal of creating an outreach program for this population will yield the highest chance of success.

My exploratory study examined survey data that was collected during a public health crisis, the COVID-19 pandemic. Therefore, this study closely examined how worldwide stressors can compound with other rural farming stressors. With this project, I planned to identify mental health promotion strategies that would be most advantageous for rural farmers in Alabama. Based on the research I did on this subject, I am now better able to recognize the importance of properly understanding cultural and historical roots of specific populations in order to better help them. In order to treat the problems associated with the mental health needs of farmers, it is vital to first identify these needs. I wanted to assist in identifying the main stressors associated with being a farmer in a rural area in Alabama. I conducted my entire project remotely, which is encouraging, considering that my population sample was largely rural in residence. I was able

to gain useful knowledge that I hope will aid in designing outreach programs for interventions for this population in the future. Farmers are often thought of as a vital lifeline of Americans, so it's even more important that this specific population is well taken care of and preserved.

Farmers have long been known to be chronically stressed as a direct result of their lifestyle and career. The physically demanding aspects of being a farmer are clear sources of stress, but farmers are also subject to financial uncertainties. A lot of their work and production depends on large equipment, so the consistent functionality of their farming machinery is essential (Deary et al., 1997). The financial losses from a broken piece of machinery can be devastating. Similar to farming machinery, other farming aspects can be unpredictable. Weather conditions and unstable crop prices can make for added stressors that farmers have no control over. Weather, like severe flooding or extreme heat, can severely impact crop yield or quality, and farming market prices may be unfavorable some years (Deary et al., 1997). It's possible that some farmers believe that their success or lack of success in farming is reflective of their self-worth, even though that is objectively not true. Farmers are also required to comply with government regulations regarding their crops, which can result in added mental strain (Deary et al., 1997). Therefore, financial stressors are extremely relevant in relation to the mental health of rural farmers.

Specific situational conditions also contribute to farmer stress. Working and living at the same place can cause a lack of division between work and time off (Swisher et al., 1998). This can lead to strained familial relationships, or unclear work-family boundaries. Since multiple-child families in a single household may run an entire farm, the question of which child will inherit the land also causes tension and consequentially, stress (Gamble et al., 1995). Some farmers' children may feel conflicted about taking on the responsibility of continuing their

father's legacy. Children of farmers may feel like they aren't capable of taking over the farm or they may want to pursue a career outside of farming, both of which are reasons that farmers' children may experience farm stress as adolescents or young adults.

Three out of four farmers report that it would be easy to access opioids (Buys et al., 2020). Studies have shown that people with mental health disorders are more likely to report opioid use than the portion of the general population that doesn't have any mental health disorders (Sullivan et al., 2006). Since opioid use is increased in the rural population, directly confronting the mental health needs of farmers may result in less opioid use.

I've outlined the reasons explaining why farmers may experience certain mental health issues, but it's just as important to explain why they are vulnerable because they often don't get the help that they need to combat these mental health issues. Just like in some urban Alabama counties, there is often a negative stigma surrounding mental health and mental illness in rural farming communities. However, the smaller populations in rural communities make people in general less likely to seek mental health treatment due to the fear of any labels that their cohorts may assign to them (Gustafson et al., 2009). Rural farmers in particular may think that seeking help would be considered complaining or being a burden, so they choose to neglect treatment instead (Booth et al., 2000). Living far from mental health clinics or providers, a lack of transportation, scarcity of adequate health services, and insufficient health insurance are a few additional explanations that account for the reasons that rural farmers may not receive the help they need (*Rural Response to Farmer Mental Health and Suicide Prevention*). For this population, recognition of the need for mental health help isn't enough to receive proper treatment.

Problem and Need

Rural areas in Alabama often lack an adequate number of mental health providers or resources. Alabama ranks at the bottom of the states for mental health workforce availability, with a population to provider ratio of 1,100:1 (*2020 Access to Care Data*). As of 2020, Alabama ranks 40th nationwide regarding prevalence of mental illness and access to mental health care (*2020 Ranking the States*). Populations in rural areas experience hardships or other lifestyle-related stressors that affect their mental health (Webb-Hehn, 2020). Rural residents are more secluded and farther away from mental health care facilities. A lack of proper mental health education may also make it difficult for rural citizens to know when or how they should seek help. Farmers are a group of individuals that struggle with physical and mental stress as a result of their daily activities (Rudolphi et al., 2020). Young farmers may be especially at risk for mental health issues compared to their older counterparts. A recent study surveyed a group of 170 young farmers (mean age 28.9), and their answers suggested that 53% of the respondents met the conditions for Major Depressive Disorder and 71% satisfied the criteria for Generalized Anxiety Disorder (Rudolphi et al., 2020). This could be due to a lack of mastery of farm-related skills and a lack of being established in the community.

Another study substantiates the claim that there is an increased prevalence of depression in farmers, and that higher social support is correlated with lower scores on the Major Depression Inventory (Bjornestad et al., 2019). Farmers are often isolated and lack social support. Social support acts as a protective factor against a plethora of mental illnesses, so this isolation may negatively impact mental health. Agricultural workers have been shown to commit suicide at a higher rate than people working in other occupations, so the high rates of depression in farmers can often sadly have a devastating effect (*Why Farmers Face Unique Threats from*

Stress). A research article by Rosmann (2010), indicates that genetics and environmental feedback may play a part in why farmers have the innate attraction to agriculture; the idea called the Agrarian Imperative refers to the idea that farmers will work extremely hard and take uncommon risks just to be able to upkeep their farm. However, this same concept also suggests that when a farmer cannot be successful in this field, he is much more likely to commit suicide as a response (Rosmann, 2010). This population doesn't have many outlets in which they can share their feelings and receive feedback, so learning more about the needs of this population is merited.

Long-term mental health problems can have a huge impact on other facets of farmers' lives. Risk of suicide is not remotely the only bad outcome related to mental health issues. Untreated or neglect of mental health status can negatively impact physical health, familial relationships, agricultural productivity, and livestock welfare (Hagen, 2019). Chronic stress due to mental health issues can result in increased risk of preventable health issues, like hypertension (Liu et al., 2017). Long-lasting mental health strain also wears down relationships with others, which can have a tangential effect. Farmers provide a lot of resources across the nation, so their mental health is crucial not only for them directly, but their productivity and long-term success indirectly contributes to the maintenance of adequate amounts of various products nationwide.

I have a background in the field of psychology, and population health. I feel strongly about my desire to better understand the rural population's stressors in Alabama. I specifically see the importance of talking directly with rural farmers in order to gain their invaluable perspective. My prior knowledge about mental health and the invaluable guidance from numerous experts in the field of rural health were key in conducting research that I hope will guide future studies on the topic of farmer mental health.

METHODOLOGY

Participants

A total of 11 participants were included in this exploratory study. These 11 Alabama residents were divided into two groups: eight agricultural workers or farmers and three rural physicians that see rural farmers as patients. To advertise for my project, I created a flyer, and it was approved by UA Strategic Communications. To recruit agricultural workers, I worked with the Tuscaloosa County Extension Office, where an agent agreed to send out an advertisement to local farmers. I also posted flyers at local places that farmers visit, including animal feed stores, cafes, and Alabama Farmers Federation (ALFA). I provided my email and phone number on the flyers and most participants contacted me via phone once they saw my flyer or heard about my study through word of mouth. I talked with academic contacts and local physicians to find and contact rural doctors that were willing to complete phone interviews for my project.

Design and Procedure

I compiled various longstanding and established questionnaires to create a survey for the agricultural workers in my study. My survey included questions from the Farm and Ranch Stress Assistance Survey, the Lubben Social Network Scale (LSNS), the Brief Multidimensional Measure of Religion and Spirituality (BMMRS), and the Patient Health Questionnaire 9 (PHQ-9). The survey also included basic demographic questions, and other inquiries about COVID-19. I transferred all survey questions onto the digital survey platform called Qualtrics. Many survey

questions were answered using a sliding scale or the questions were multiple choice. The farmers were also asked open-ended interview questions and Qualtrics allowed for them to type their responses. For the rural physician qualitative interviews, I crafted a list of interview questions pertaining to their experiences treating rural farmers as patients. I transcribed the physicians' answers to these open-ended questions.

There were two main groups in this study: the rural farmer group and the rural physician group. The procedure for the rural farmer surveys and interviews was different than the procedure for the physician interviews. Once an interested agricultural worker participant contacted me, I confirmed that the person met inclusion criteria. To meet inclusion criteria, participants had to be working as an agricultural worker or as a farmer in rural Alabama. To confirm rural status, I entered their zip code into the Am I Rural? Tool on the Rural Health Information Hub website. If they met this inclusion criteria, I explained the scope of the study and what their role in the study would be if they decided to participate. I then sent them a copy of the informed consent document that I created for participants. They were given a chance to read the document and ask questions, sign it, and once they returned it to me, I either sent them the link to the Qualtrics survey or I scheduled a phone interview with them, during which I asked them the exact questions from the Qualtrics survey and recorded their answers into Qualtrics. The agricultural workers answered a series of survey questions from established batteries that are designed to examine perception of stress, social support, religious views, and symptoms of depression. After completion of the survey, their participation in my study concluded.

At the advice of a physician in academia, I reached out by phone and by email to various doctors that serve rural areas in Alabama. My goal was to combine the perspectives from both the rural farmers and their providers to create the most accurate portrayal of the current state of

farmers' mental health in Alabama. After I found willing physicians who showed interest in being interviewed, I sent them an informed consent. I gave them ample time to read this document, sign it, and return it to me. This served as their agreement to be interviewed, granted that they could choose not to answer any question for any reason. I scheduled an interview with each willing physician and then I verbally asked them pre-determined questions from a script that I created at the beginning of my research process. I transcribed their answers to my questions verbatim to preserve the intended meaning of their responses.

RESULTS

Demographics

All farming participants were from either Tuscaloosa, Pickens, or Bibb County in Alabama. Of the survey participants, all eight worked in the agricultural or farming industry in some capacity. Seven of the survey participants identified as males and one identified as a female. Seven participants were White, and one participant was African American. The most common age range of the survey participants was 51-60. There were two age-related outliers; one participant was within the 18-30 age range and one participant was in the 61 and older range. Of the eight people, five participants worked in some other capacity to supplement their farming income. Three participants worked primarily within the livestock industry, one worked in the poultry and egg business, one worked in the grain industry, one worked in the logging (forest products) business, one reported vegetables as their leading cash crop, and one worked primarily with field crops. Education level of farming participants ranged from high school to having a 4-year degree. Three participants reported that they had attended some college, while two participants had an Associate's degree, and two participants had a Bachelor's degree. There was a notable variety regarding marital status between survey participants. Five participants were married, two participants were single, and one participant was widowed. Participants' years of experience in the agricultural field ranged from five years to 65 years.

Of the three physicians included in my study, one was a female, and two were males. I spoke with Alabama-licensed physicians that practice in Reform, Aliceville, and Moundville.

Each interviewee had over 20 years of medical experience to draw upon in their responses to my inquiries.

		Frequency	Percent
Age	18-30	1	11.1
	51-60	6	66.7
	61+	1	11.1
Gender	Male	7	77.8
	Female	1	11.1
Race	White	7	77.8
	African American	1	11.1
Education	High school graduate	1	11.1
	Some college	3	33.3
	2 year degree	2	22.2
	4 year degree	2	22.2
County	Bibb	2	22.2
	Pickens	1	11.1
	Tuscaloosa	5	55.6
Farming Subtype	Vegetables or melons	1	11.1
	Livestock	3	33.3
	Field crops	1	11.1
	Poultry & eggs	1	11.1
	Cash grain	1	11.1
	Forest products	1	11.1

Table 1: Demographic information of rural farmers and agricultural workers.

Surveys and Interviews

There were many questions and variables of interest in the Farm and Ranch Stress Assistance Survey. I calculated mean scores for each question in order to estimate the average responses between all eight of the farmers in my study. I used SPSS to sum and average the data to ensure accuracy and to reduce any mathematical errors.

On a scale of one to four, farmers in my study most commonly reported that the following four things led them to feel stress within the last year: the ability to sell products ($M = 2.125$), family succession ($M = 2.25$), lack of time to rest or complete tasks ($M = 2.875$), and commodity prices ($M = 3$). Conversely, on a scale of one to five, farmers also commonly reported that they felt that they were able to control irritations in their life ($M = 4.125$) and that they felt confident in their ability to handle their personal problems ($M = 4.375$). Reporting on a scale of one to five regarding other common stressors, farmers were more likely to report

stressing over the weather ($M = 2.875$) than they were to report stressing about family ($M = 2.75$), COVID-19 ($M = 2.75$), or interpersonal issues ($M = 1.875$). Specifically, rain and heat were the two most common weather conditions that farmers perceived as stressors. When questioned about interest in potential resources to help manage different stressors, the farmers, on average, reported that they were most interested in learning more about financial assistance and nutrition or cooking.

The farmers' Lubben Social Network Scale scores ranged from 30 to 47. The average Lubben Social score was approximately 40. Overall, the data indicated that when asked in a straightforward manner, farmers are not likely to report extreme feelings of depression or anxiety. Between all eight survey participants, the average PHQ-9 summed score was a little above three, with only three people scoring between six and nine. Of the PHQ-9, the two most commonly reported responses indicated that the farmers felt down, depressed, or hopeless ($M = 0.625$) and that they felt tired and had little energy ($M = 0.875$).

I also utilized SPSS to statistically analyze my data via a series of correlations between different variables. I ran bivariate correlations to find Pearson correlation coefficients with two-tailed test of significance at the 95% confidence interval.

A Pearson correlation coefficient was calculated to examine the relationship between the age of survey participants and PHQ-9 scores. There was a notable negative correlation between age and PHQ-9 scores, $r = -.719$, $N = 8$, and the relationship was statistically significant ($p = .045$). An additional Pearson correlation test confirmed that there was also a strong positive correlation between age and self-reported religious alignments, $r = .794$, $N = 8$, and the relationship was significant ($p = .018$) at the 95% confidence level.

Correlations

		agecat	phq9sum
agecat	Pearson Correlation	1	-.719*
	Sig. (2-tailed)		.045
	N	8	8
phq9sum	Pearson Correlation	-.719*	1
	Sig. (2-tailed)	.045	
	N	8	8

*. Correlation is significant at the 0.05 level (2-tailed).

Table 2: Negative correlation between age and PHQ-9 score.

Correlations

		agecat	BMMRSsum
agecat	Pearson Correlation	1	.794*
	Sig. (2-tailed)		.018
	N	8	8
BMMRSsum	Pearson Correlation	.794*	1
	Sig. (2-tailed)	.018	
	N	8	8

*. Correlation is significant at the 0.05 level (2-tailed).

Table 3: Positive correlation between age and BMMRS score.

Regarding education status, there was a correlation between education level and reported feelings of having a “lack of time” to do things that needed to get done. Specifically, there was a strong positive correlation between these two variables, $r = .857$, $N = 8$; the relationship was significant ($p = .007$). There was a weak positive relationship between education level and stress surrounding family succession of the farm, $r = .604$, $N = 8$; the correlation was not statistically significant ($p = .113$). There was also a positive correlation between education level and reported feelings of grief, $r = .762$, $N = 8$, and the relationship was statistically significant ($p = .028$). Specifically, individuals with a 2-year degree or a 4-year degree were more likely to report feelings of grief at four times the rate of those with a high school diploma or some college education (see figure 1).

Correlations

		education	lackoftime
education	Pearson Correlation	1	.857**
	Sig. (2-tailed)		.007
	N	8	8
lackoftime	Pearson Correlation	.857**	1
	Sig. (2-tailed)	.007	
	N	8	8

** . Correlation is significant at the 0.01 level (2-tailed).

Table 4: Positive correlation between education and feeling a “lack of time”.

Correlations

		education	familysucce sionoffarm
education	Pearson Correlation	1	.604
	Sig. (2-tailed)		.113
	N	8	8
familysucce sionoffarm	Pearson Correlation	.604	1
	Sig. (2-tailed)	.113	
	N	8	8

Table 5: Positive correlation between education and stress about family succession.

Correlations

		education	grief
education	Pearson Correlation	1	.762*
	Sig. (2-tailed)		.028
	N	8	8
grief	Pearson Correlation	.762*	1
	Sig. (2-tailed)	.028	
	N	8	8

*. Correlation is significant at the 0.05 level (2-tailed).

Table 6: Positive correlation between education and feelings of grief.

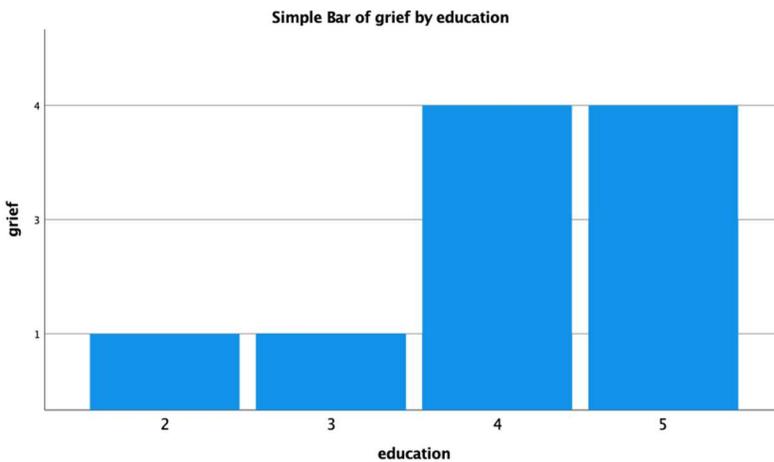


Figure 1: Bar chart showing less grief in those with a high school education (2) and some college (3) when compared to those with a 2-year degree (4) and 4-year degree (5).

The interview questions for the farmers were about COVID-19 and the effects that the pandemic has had on their lives. One participant reported that the pandemic caused too much emphasis on the issue of COVID-19 despite the various other health issues that affect everyone. Specifically, this participant experienced socioeconomic stressors accompanied with familial death not due to COVID-19 and subsequent grief. Another participant reported that being forced to wear masks at the outdoor farmer's market and seeing smaller crowds at the farmer's market had a huge negative impact on his mental state and his revenue from his produce. Stress surrounding mask mandates and various shortages in supplies and necessary farming products were also reported. One farmer even added that due to the nature of farming as a career, there are no off days; therefore, contracting COVID-19 as a farmer is even worse because it's not an option to take the appropriate time off to rest and recuperate. One farmer in my study lost their brother to COVID-19, and they were not able to take very many days off to properly grieve and mentally heal because they had crops that needed to be harvested.

Another farmer stated that not being able to go and do the things that he normally did and not being able to see the people that he wanted to see has been the worst part of the pandemic. Most of the open-ended responses to this inquiry about COVID-19 related stressors mentioned feelings of isolation. Nearly half of the farmers reported that COVID-19 brought them feelings of overall sadness and increased worry. However, multiple participants also independently stated that COVID-19 had increased their trust in the Lord and brought them closer to God.

For the purposes of this study, the physicians that were interviewed will remain anonymous. The first doctor will be referred to as Dr. A. This doctor treats approximately 15 farmers weekly at their rural clinic. They reported that they treat farmers for anxiety, depression, and that a few farmers also experience attention deficit disorder (ADD). When asked about some

stressors that may be leading contributors to the farmers' mental health problems, Dr. A listed fluctuations in weather, bills, provision for family members, transportation for their kids, and house-related duties. This doctor thinks that access to care during hours that work for farmers is something that would help this population address their mental health needs. If some clinics were able to offer extended hours, even possibly via telehealth, then farmers would likely benefit. This doctor stated that farmers spend the daylight hours working everyday unless it's raining, so meeting them in the middle with extended hours could encourage them to take time to talk about their mental health.

Dr. B treats 20 to 30 rural farmers and the farmers' families. This doctor stated that they treat farmers for both physical and mental health ailments, but that most farmers are very stoic. They don't present early with symptoms of depression or anxiety like some other individuals do. Instead, their spouses will bring in the farmers and tell the doctor that they believe their farming spouse is depressed or stressed. Dr. B added that farmers aren't very forthcoming even when you ask them questions directly. If you suspect that they may be experiencing depression or anxiety, you must drag the information out of them. This doctor emphasized that from their experience, it seems that the majority of farmers view any admission to needing help with their mental health as a weakness so they try to avoid talking about it. Dr. B treats farmers for depression, anxiety, and even alcoholism. They added that they often observe farmers in domestic abuse situations or farmers that go through divorces during the middle of their farming career. Regarding potential stressors, Dr. B said that the long working hours, bank debt, weather variation, and commodity price fluctuation are a few of the most common stressors that they hear about from farmers. This doctor also emphasized that the weather and prices are especially stressful because they represent the lack of control that farmers have over their own career success and financial stability. If a

farmer has children or family, then their family's schedule and the prospect of trying to ensure that their kids get to school or other places can be difficult. This doctor also explained that farmers have social lives in which they don't talk about mental health with their friends, family, or colleagues. In fact, a lot of farmers' social isolation may be attributed to the fact that farmers bond more with other farmers than they do with the general population, including physicians. This doctor said they have seen the most progress and success with intervening in farmers' mental health problems by going through the farmers' spouses.

Dr. C treats a variety of different farmers and agricultural workers, including cattle farmers and catfish farmers, and they see around seven to 10 farmers at their clinic weekly, depending on the weather. They see farmers mostly for physical ailments since farmers very rarely come into the clinic explicitly saying that they need mental health support. This doctor, like the other physicians, emphasizes that all clinicians must dig deeper in farmers' mental states because many farmers will repeatedly try and avoid any discussion of mental health. Dr C most commonly treats farmers for stress and anxiety. They added that the stress and anxiety are often tied to commodity prices fluctuating with little to no warning. Dr. C said that family problems or family conflict, long working hours, and worrying about providing for their family are a few potential stressors that could be contributing to any of the farmers' increased anxiety. When I asked about potential interventions for this population, Dr. C highlighted the fact that farmers with mental health problems fare better with talking to someone rather than taking medications. They believe that finding times for professionals to talk with farmers would help much more than medication, especially since a lot of farmers don't want to take any pills for mental health reasons. He mentioned that peer support groups may be especially beneficial.

DISCUSSION

In my exploratory study, I set out to investigate the mental health problems that rural farmers and agricultural workers experience in Alabama. Previous research on this topic implicated specific stressors that contribute to poor farmer mental health, including the unpredictable nature of the weather, social isolation, and worries about who the successor of their farming business will be. Financial issues are a source of stress and anxiety for anyone, but especially to the farming population. My exploratory study examined previously studied stressors and it also investigated less studied stressors. The results of my study indicate that farmers are especially stressed about being able to sell their products and about who will take over the farm after they can no longer maintain it. They also feel like they lack the time to get all their tasks done while balancing their home life and getting adequate sleep. My study suggested that a short questionnaire is not thorough enough to gather the necessary information to assess depression and anxiety symptoms in this population. The small sample size did not widely report intense feelings of depression. They reported moderate social support from friends and family. According to the participants' scores on the PHQ-9, three farmers presented with mild depression symptoms, which is a high percentage of such a small sample.

The statistical analyses and correlations implied that there is a negative correlation between age and PHQ-9 scores and a positive relationship between age and self-reported religious alignments. This means that as a person gets older, they may be less likely to report or experience depressive symptoms, and they may be more likely to report strong religious

convictions. Both of these findings suggest that age could be a protective factor against anxiety, stress, and depression in the rural farming population. There were also many correlations between education level and variables of interest. According to my results, people with higher levels of education were more likely to report feeling like they lacked the time to do things that they needed to get done. As education level increased, individuals were more likely to report feelings of stress about familial succession of their farm. Finally, the results indicated that as education level increased, more farmers reported feeling stressed because of grief. Based on these findings, it seems that education level increases stress level in multiple facets of a farmer's life, though the relationship between education level and farm stress is not clear.

The farmers' responses revealed a lot about how the pandemic has affected this population in comparison to the general public. COVID-19 caused worldwide shutdowns of various businesses and industries, and many people were able to work from home to avoid catching this disease. However, farmers and their work didn't stop. Though there was still lots of agricultural planning and labor to be done during the pandemic, the various routes of selling and distributing products placed additional stress on farmers. Multiple farmers indicated that mask mandates caused them stress because seeing and connecting with people at farmer's markets is a main source of income. Because of worker shortages around the globe, farmers have experienced a shortage in supplies that they use on their farm, which has made it more difficult for them to consistently get their work done. The open-response answers also highlighted the fact that farmers weren't given any time off if they became sick with COVID-19 since their job requires daily work. The fear of catching COVID-19 and the anxiety of being able to work while having COVID-19 could have potentially worsened the mental health of these farmers in the past two years. Finally, farmers indicated that they missed many social gatherings and seeing people

throughout the pandemic, which is not a positive addition to their social support system that often improves mental health.

The doctors qualitatively identified the most common mental health issues that farmers present with, which are stress, anxiety, depression, alcoholism, and sometimes ADD. Recent studies have implicated anxiety and depression in the farming population, but the results of my study suggest that there may be additional mental health diagnoses that should be further examined. In the rural physician interview, many previously studied farmer stressors were mentioned, including long work hours, weather unpredictability, commodity price fluctuation, worry about being able to provide for their families. All of the physicians included in my study indicated that farmers are often closed off in a clinical setting and that coaxing farmers to discuss mental health in general is often difficult. Therefore, I believe that more studies that are conducted in a non-clinical setting, like this study, would be beneficial in comparison to studies that require farmers to spend extra time driving to a formal study setting. Farmers enjoy talking about their profession so if they are able to talk about their work with a professional and then discuss their mental health, they are more likely to be open and provide honest responses. Based on the physicians' opinions, interventions involving after hours telehealth options, spousal interviews, and peer support groups held after business hours may be effective in improving the mental health of rural farmers in Alabama. Most farmers indicated that they would prefer in-person counseling rather than telehealth counseling, if offered. Therefore, an in-person after-hours clinic held monthly or bi-monthly may also be beneficial. The results of my study also revealed some positive aspects of farmers' mental health. On average, the farmers in my study reported that they felt in control of the stressors in their life and that they felt like they were able to handle their own personal problems. Those two reports from the survey results suggest that

despite many stressors outside their control, farmers may have a predominantly internal locus of control. Having an internal locus of control is a good thing for mental health because people who have this mindset rather than having an external locus of control are often happier and physically healthier. The survey results also indicate that religious ties are strong within the rural farming community, so this relationship could be explored when designing interventions for farmers' mental health, since religion is often an effective coping mechanism.

Limitations

The small sample size is a big limitation of the predictive quality of my study. The small number of surveyed farmers also limits the variation in reported gender and race. Increasing the sample size would increase the applications of the results of my study. This study's objective was to explore rural farm stress and mental health, but larger studies could be replicated with a larger sample size. The counties that were represented by participants were also not varied enough to properly represent the entire state of Alabama. Because of the limitations of my study, the statistical significance cannot be used to draw any concrete conclusions, but my statistical data may possibly be used as a guide for future studies about the farming and agricultural population.

FUTURE CONSIDERATIONS

Because of the COVID-19 rates that continue to spike every few months, this research study was conducted entirely remotely. Conducting research with farmers via email and phone calls proved to be difficult at times because of scant internet service or cellular service connections, but I was able to collect data, nonetheless. Past studies on the farming populations were mainly done in-person because of internet barriers, but my study indicates that conducting future studies remotely with farming populations is not entirely impossible.

Within this field of research, it is important to note that there is a difference in stressors between farmers that work in the industry on their own property and farmers that own land on which they allow others to use for agricultural purposes. Regarding farmers that personally conduct their work on their own land, the size of the farming operation and the equipment being used has an impact on the farmer's type of stress and stress level. For instance, farmers with large irrigation systems will likely experience less stress due to the weather when compared to a farmer who lacks a large irrigation system for his crops. My study did not survey the farmers for these types of clarifications about their work, but it would be important to investigate these variations between farmers in future research. My project included farmers that worked within one of six different subtypes of farming or agriculture. Since the type of farming being done or the type of crop being produced can affect stress level either positively or negatively, it makes sense for future rural farming studies to focus on one specific type of farming subtype or to investigate the influences that farming subtypes may have on various reported farm stressors.

Based on the results of my physician interviews, it would be useful to conduct future studies that assess alcohol consumption and the ability to focus or concentrate. I believe these qualities to be of interest because physicians said that they saw alcoholism and ADD in their farmer population, which are two conditions that lack adequate research. I think it would also be useful to collect more data about anxiety, especially since COVID-19 has likely affected the anxiety level in this population. I would suggest using the GAD-7 for this purpose. My experience in doing a portion of the surveys over the phone with the farmers revealed that discussion of revenue from their products was often something that they did not seem excited to discuss. In fact, inquiring about their agricultural revenue may have made them more closed off in their subsequent responses, so I would advise against this in future studies. Any future studies would also likely benefit from adding many open-ended questions because farmers love to be able to elaborate on different things in a non-clinical setting. Finally, a study that aims to examine the spouses of farmers may prove beneficial because the spouses may be able to provide better insight into the stressors that they see affecting their spouse on a day-to-day basis

When designing my research project, I chose to interview rural family medicine doctors that treat farmers because in rural areas, more patients see family medicine physicians for mental health reasons than they see psychiatrists for mental health reasons. This is not a surprise due to the fact that there are generally less psychiatrists available to see in rural areas and there is also some unwarranted stigma associated with going to see a psychiatrist compared to going to a family medicine doctor. This situation increases the importance of training more doctors to be family medicine providers in rural areas, and it also highlights the importance of conducting more research about rural mental health that includes the opinions of family medicine doctors.

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APPENDIX A: QUALTRICS SURVEY QUESTIONS FOR FARMERS

Basic Demographic Questionnaire

1. How old are you?
 - 18-30
 - 31-40
 - 41-50
 - 51-60
 - 61+
2. Which gender do you identify with?
 - Male
 - Female
 - Non-binary/third-gender
 - Prefer not to say
3. What is your race/ethnicity?
 - White
 - Black or African American
 - American Indian or Alaska Native
 - Asian
 - Native Hawaiian or Pacific Islander
 - Other
4. What is your marital status?
 - Single
 - Married
 - Divorced
 - Dating
 - Widowed
5. Which option below best describes your level of education?
 - Less than high school
 - High school graduate
 - Some college
 - 2 year degree (Associate's degree)
 - 4 year degree (Bachelor's degree)
 - Graduate degree (Master's or Doctoral degree)
6. What is your annual household income?
 - Less than \$10,000
 - \$10,000-\$29,999
 - \$30,000-\$49,999
 - \$50,000-\$69,999

\$70,000-\$89,999

\$90,000 or above

7. Are you a farmer/agricultural worker?

Yes

No

8. What county do you live in?

Farm and Ranch Stress Assistance Survey

The questions in this scale ask you about your feelings and thoughts during the last month. In each case, you will be asked to indicate how often you felt or thought a certain way. Fill in the circle that best fits your response to each question.

1 = never 2 = almost never 3 = sometimes 4 = fairly often 5 = very often

1. In the last month, how often have you been upset because of something that happened unexpectedly?

1

2

3

4

5

2. In the last month, how often have you felt that you were unable to control the important things in your life?

1

2

3

4

5

3. In the last month, how often have you felt nervous and “stressed”?

1

2

3

4

5

4. In the last month, how often have you felt confident about your ability to handle your personal problems?

1

2

3

4

5

5. In the last month, how often have you felt that things were going your way?

1

- 2
- 3
- 4
- 5

6. In the last month, how often have you found that you could not cope with all the things that you had to do?

- 1
- 2
- 3
- 4
- 5

7. In the last month, how often have you been able to control irritations in your life?

- 1
- 2
- 3
- 4
- 5

8. Within the last month, how often have you felt that you were on top of things?

- 1
- 2
- 3
- 4
- 5

9. In the last month, how often have you been angered because of things that were outside of your control?

- 1
- 2
- 3
- 4
- 5

Within the last year, please indicate how often the following led you to experience stress:

- Ability to sell products
 - Never
 - Almost never
 - Sometimes
 - Fairly often
- Cognitive/emotional disability
 - Never

Almost never
Sometimes
Fairly often

- Commodity prices
Never
Almost never
Sometimes
Fairly often
- Crop/plant disease
Never
Almost never
Sometimes
Fairly often
- Family succession of the farm/ranch or business
Never
Almost never
Sometimes
Fairly often
- Financial worries (loans, debts, bank pressure, etc.)
Never
Almost never
Sometimes
Fairly often
- Grief (death of a loved one or community member)
Never
Almost never
Sometimes
Fairly often
- Increased labor costs
Never
Almost never
Sometimes
Fairly often
- International trade policies
Never
Almost never
Sometimes
Fairly often

- Lack of time (no time to rest, complete tasks well, etc.)
Never
Almost never
Sometimes
Fairly often
- Legislative issues related to agriculture (adapting to new regulations, etc.)
Never
Almost never
Sometimes
Fairly often
- Livestock (disease, injury, reproductive issues)
Never
Almost never
Sometimes
Fairly often

Within the last year, please indicate how often the following led you to experience stress:

- Family
Never
Almost never
Sometimes
Fairly often
Very often

If so, specifically with (please select all that apply):

- Domestic partner/spouse
- Childcare
- Parenting
- Eldercare
- All of the above
- Other: _____

Within the last year, please indicate how often the following led you to experience stress:

- COVID-19
Never
Almost never
Sometimes
Fairly often
Very often

If so, how exactly has COVID-19 increased your stress: _____

Within the last year, please indicate how often the following led you to experience stress:

- Interpersonal issues
 - Never
 - Almost never
 - Sometimes
 - Fairly often
 - Very often

If so, specifically with whom (please select all that apply):

- Business associates
- Friends
- Partners
- All of the above
- Other _____

Within the last year, please indicate how often the following led you to experience stress:

- Weather
 - Never
 - Almost never
 - Sometimes
 - Fairly often
 - Very often

If so, specifically (please select all that apply):

- Wind
- Rain
- Drought
- Flood
- Dust
- Hurricane/tropical storm
- Heat
- Cold
- Hail
- Changing climate
- Snow
- Other _____

When you think about your overall financial situation, how does it look to you?

1 = dismal, 10 = secure

1 2 3 4 5 6 7 8 9 10

To help you manage and/or cope with your stress, how interested would you be to learn about the following topics if the content was made available to you? Fill in the circle that best fits your response:

- Alcohol and/or drug misuse cessation/rehabilitation

No interest
Neutral
Mildly interested
Interested

- Career/vocational support

No interest
Neutral
Mildly interested
Interested

- Financial assistance

No interest
Neutral
Mildly interested
Interested

- Grief counseling

No interest
Neutral
Mildly interested
Interested

- Mental health counseling

No interest
Neutral
Mildly interested
Interested

- Mindfulness (breathing exercises, relaxation techniques, meditation, yoga)

No interest
Neutral
Mildly interested
Interested

- Nutrition and cooking

No interest
Neutral
Mildly interested
Interested

- Parenting

No interest
Neutral
Mildly interested
Interested

- Physical activity (strength training, cardio)
 - No interest
 - Neutral
 - Mildly interested
 - Interested

- Physical rehabilitation
 - No interest
 - Neutral
 - Mildly interested
 - Interested

- Problem solving techniques
 - No interest
 - Neutral
 - Mildly interested
 - Interested

- Relationship support (with coworkers/friends/family)
 - No interest
 - Neutral
 - Mildly interested
 - Interested

In thinking about the topics from the previous question that you are interested in learning about, how would you be interested in receiving this information? Select all that apply.

- Ag-specific telephone help line (i.e. Farm Aid)
- General telephone help line
- Face-to-face counseling
- Individual consultation
- In-person class in your community
- Online or webinar class with an instructor
- Online, self-guided class on your own time (no instructor present)
- Online library of resources
- Podcast
- Printed resources (i.e. newsletters, articles, factsheets) mailed to you
- Printed resources (i.e. newsletters, articles, factsheets) available at your local Extension office
- Radio
- Religious/church/spiritual leaders
- Social media (i.e. Facebook)
- TV
- Telehealth counseling

If the way you would like to learn about a specific topic varies by topic, please feel free to elaborate here:

If all were available to you in your community, how likely would you be to make use of the following resources and learning opportunities?

- Discussing stress, health, and wellness topics with someone you know well, at informal events (during a potluck, at a backyard barbecue, coffee shop, etc.)
Very unlikely
Unlikely
Uncertain
- Discussing stress, health, and wellness topics with a representative working on behalf of your community or health organization.
Very unlikely
Unlikely
Uncertain
- Learning about stress management and mental health through a brief, self-paced online course.
Very unlikely
Unlikely
Uncertain
- Talking to a peer listener, about stress and mental health (a peer listener is a member of the agricultural community who is trained to listen and respond to their neighbors and direct them to available resources).
Very unlikely
Unlikely
Uncertain
- Participating in community planning sessions to identify and address health and wellness issues in your community.
Very unlikely
Unlikely
Uncertain
- Participating in virtual (i.e. Zoom, Skype) informal discussion groups.
Very unlikely
Unlikely
Uncertain
- Participating in online or telephone counseling/therapy.
Very unlikely
Unlikely
Uncertain
- Participating in a support group.

Very unlikely
Unlikely
Uncertain

How many years have you worked in the agricultural industry (numerical)?

Do you or anyone else in your household work outside of the farm/ranch?

Yes

No

If yes, in what occupation:

What is the leading cash crop or product on your farm/ranch (please select all that apply):

Animal specialty (horses/ponies, fish, other animal specialties)

Livestock (beef cattle, hogs and pigs, sheep and goats, general livestock except noted above)

Dairy cattle and milk products

Poultry and eggs (broiler, fryer, roaster chickens, chickens (layers), turkeys, other poultry)

Cash grain (barley, proso millet, sunflower seeds, beans, dry edible except limas, rye, wheat, corn (grain or seed), sorghum (grain or seed), oats, soybeans, other cash grains)

Field crops (alfalfa, Irish potatoes, yams, taro, corn (silage or green chop) sorghum (silage or green chop), hay (except alfalfa), cotton, other field crops)

Floriculture

Forest products

Fruits and tree nuts (berries, orchards, vineyards, other fruits and tree nuts)

Horticulture specialty (nursery, greenhouse crops)

Vegetables or melons

Apiary/Bee keeping

What was the approximate gross revenue of all products (crops and animals) from this farm/ranch in the past year?

\$0 - \$999

\$1,000 - \$39,000

\$40,000 - \$99,000

\$100,000 - \$499,000

\$500,000 - \$999,000

\$1,000,000 - \$1,499,000

\$1,500,000 - \$1,999,000

\$2,000,000 or more

I prefer not to disclose

Lubben Social Network Scale (LSNS-R)

1. How many relatives do you see or hear from at least once a month?

None

1

- 2
 - 3-4
 - 5-8
 - 9+
2. How often do you see or hear from the relative with whom you have the most contact?
 - Less than monthly
 - Monthly
 - Few times a month
 - Weekly
 - Few times a week
 - Daily
 3. How many relatives do you feel at ease with that you can talk about private matters?
 - None
 - 1
 - 2
 - 3-4
 - 5-8
 - 9+
 4. How many relatives do you feel close to such that you could call on them for help?
 - None
 - 1
 - 2
 - 3-4
 - 5-8
 - 9+
 5. When one of your relatives has an important decision to make, how often do they talk to you about it?
 - Never
 - Seldom
 - Sometimes
 - Often
 - Very often
 - Always
 6. How often is one of your relatives available for you to talk to when you have an important decision to make?
 - Never
 - Seldom
 - Sometimes
 - Often
 - Very often
 - Always
 7. How many of your friends do you see or hear from at least once a month?
 - None
 - 1
 - 2
 - 3-4

- 5-8
9+
8. How often do you see or hear from the friend with whom you have the most contact?
Less than monthly
Monthly
Few times a month
Weekly
Few times a week
Daily
9. How many friends do you feel at ease with that you can talk about private matters?
None
1
2
3-4
5-8
9+
10. How many friends do you feel close to such that you could call on them for help?
None
1
2
3-4
5-8
9+
11. When one of your friends has an important decision to make, how often do they talk to you about it?
Never
Seldom
Sometimes
Often
Very often
Always
12. How often is one of your friends available for you to talk to when you have an important decision to make?
Never
Seldom
Sometimes
Often
Very often
Always

The Brief Multidimensional Measure of Religion and Spirituality (BMMRS)

1. I feel God's presence.
Many times a day
Every day
Most days

- Some days
Once in a while
Never or almost never
2. I experience a connection to all of life.
Many times a day
Every day
Most days
Some days
Once in a while
Never or almost never
3. During worship, or at other times when connecting with God, I feel intense joy which lifts me out of my daily concerns.
Many times a day
Every day
Most days
Some days
Once in a while
Never or almost never
4. I find strength in my religion or spirituality.
Many times a day
Every day
Most days
Some days
Once in a while
Never or almost never
5. I find comfort in my religion or spirituality.
Many times a day
Every day
Most days
Some days
Once in a while
Never or almost never
6. I feel deep inner peace or harmony.
Many times a day
Every day
Most days
Some days
Once in a while
Never or almost never
7. I ask for God's help in the midst of daily activities.
Many times a day
Every day
Most days
Some days
Once in a while
Never or almost never

8. I feel guided by God in the midst of daily activities.
 - Many times a day
 - Every day
 - Most days
 - Some days
 - Once in a while
 - Never or almost never
9. I feel God's love for me directly.
 - Many times a day
 - Every day
 - Most days
 - Some days
 - Once in a while
 - Never or almost never
10. I feel God's love for me through others.
 - Many times a day
 - Every day
 - Most days
 - Some days
 - Once in a while
 - Never or almost never
11. I am spiritually touched by the beauty of creation.
 - Many times a day
 - Every day
 - Most days
 - Some days
 - Once in a while
 - Never or almost never
12. I feel thankful for my blessings.
 - Many times a day
 - Every day
 - Most days
 - Some days
 - Once in a while
 - Never or almost never
13. I feel a selfless caring for others.
 - Many times a day
 - Every day
 - Most days
 - Some days
 - Once in a while
 - Never or almost never
14. I accept others even when they do things I think are wrong.
 - Many times a day
 - Every day
 - Most days

- Some days
 - Once in a while
 - Never or almost never
15. I desire to be closer to God or in union with Him.
- Not at all close
 - Somewhat close
 - Very close
 - As close as possible
16. In general, how close do you feel to God?
- Not at all close
 - Somewhat close
 - Very close
 - As close as possible

Patient Health Questionnaire-9

How often have you been bothered by the following in the past 2 weeks?

1. Little interest or pleasure in doing things?
 - Not at all
 - Several days
 - More than half the days
 - Nearly every day
2. Feeling down, depressed, or hopeless?
 - Not at all
 - Several days
 - More than half the days
 - Nearly every day
3. Trouble falling or staying asleep, or sleeping too much?
 - Not at all
 - Several days
 - More than half the days
 - Nearly every day
4. Feeling tired or having little energy?
 - Not at all
 - Several days
 - More than half the days
 - Nearly every day
5. Poor appetite or overeating?
 - Not at all
 - Several days
 - More than half the days
 - Nearly every day
6. Feeling bad about yourself — or that you are a failure or have let yourself or your family down?
 - Not at all
 - Several days
 - More than half the days

- Nearly every day
7. Trouble concentrating on things, such as reading the newspaper or watching television?
 Not at all
 Several days
 More than half the days
 Nearly every day
8. Moving or speaking so slowly that other people could have noticed? Or so fidgety or restless that you have been moving a lot more than usual?
 Not at all
 Several days
 More than half the days
 Nearly every day
9. Thoughts that you would be better off dead, or thoughts of hurting yourself in some way?
 Not at all
 Several days
 More than half the days
 Nearly every day

COVID-19 Questions

1. Using the scale below, please describe how the COVID-19 pandemic has impacted you. (1 meaning very negatively, 2 meaning slightly negatively, 3 meaning no effect, 4 meaning slightly positively, 5 meaning very positively)
2. Has the COVID-19 pandemic made you feel any of the following: (check multiple)
 Increased worry
 Increased feelings of depression
 Suicidal thoughts
 Feelings of overall sadness
 Mood swings
 Brain fog
3. How has COVID-19 affected you? (fill in blank)
4. Using the scale below, please describe how the COVID-19 pandemic has impacted you financially. (1 meaning very negatively, 2 meaning slightly negatively, 3 meaning no effect, 4 meaning slightly positively, 5 meaning very positively).

APPENDIX B: QUALITATIVE PHYSICIAN INTERVIEW SCRIPT

- Do you treat any rural *farmers* at your practice?
- Do you mostly see rural farmers for physical ailments, or do you also treat them for mental health needs?
- Do rural farmers seem reluctant to discuss their mental or physical health needs with you?
- What are some common mental health problems in the rural farmer population, from your perspective?
- What are some stressors that you would attribute rural farmers' common mental health problems to?
- From your experience, what kinds of interventions do you think would most help this population's mental health?

APPENDIX C: IRB APPROVAL



August 5, 2021

Cayla D. Gilliland, BS
Department of Community Medicine & Population Health
College of Community Health Sciences
The University of Alabama
Box 870326

Re: IRB # 20-10-4068 "Harvesting Happiness: A Closer Look into Rural Farmers' Mental Health"

Dear Ms. Gilliland:

The University of Alabama Institutional Review Board has granted approval for your renewal application. Your renewal application has been given exempt approval according to 45 CFR part 46.104(d)(2) as outlined below:

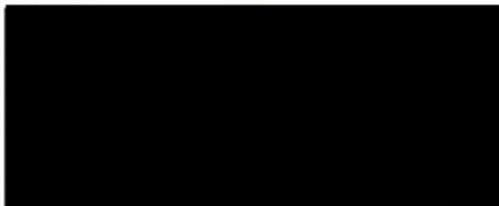
(2) Research that only includes interactions involving educational tests (cognitive, diagnostic, aptitude, achievement), survey procedures, interview procedures, or observation of public behavior (including visual or auditory recording) if at least one of the following criteria is met: (iii) The information obtained is recorded by the investigator in such a manner that the identity of the human subjects can readily be ascertained, directly or through identifiers linked to the subjects, and an IRB conducts a limited IRB review to make the determination required by §46.111(a)(7).

The approval for your application will lapse on August 4, 2022. If your research will continue beyond this date, please submit the annual report to the IRB as required by University policy before the lapse. Please note, any modifications made in research design, methodology, or procedures must be submitted to and approved by the IRB before implementation. Please submit a final report form when the study is complete.

Please use reproductions of the IRB approved informed consent form to obtain consent from your participants.

Good luck with your research.

Sincerely,



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