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DEPRESSIVE SYMPTOMS AMONG FARM WOMEN AGED 50 AND OLDER

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DEPRESSIVE SYMPTOMS AMONG FARM WOMEN AGED 50 AND OLDER

A dissertation submitted in partial fulfillment of the requirements for the degree of Doctor of Philosophy in the College of Nursing at the University of Kentucky

By
Cheryl Dean Witt

Lexington, Kentucky
Director: Dr. Deborah Reed, Professor of Nursing
Lexington, Kentucky
2019
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Alarming rates of suicide among production farmers have prompted researchers to investigate factors associated with depressive symptoms among this population. Aspects of farm life and farming can contribute to higher levels of depressive symptoms. Higher levels of depression can also increase an individual’s risk of injury and development of chronic disease, impacting overall quality of life. Despite the approximate 3.5 million farm women in the U.S., current research has focused on the male farmer.

Men and women have different responses to stressors, and women in general have a higher prevalence of depressive symptoms. Farm women can be further subjected to stressors associated with farming as an occupation and their gendered role within the agrarian culture. The large number of farm women affected, the relationship of chronic depressive symptoms on health and quality of life, the lack of current research available, and the rising rates of suicide and depressive symptoms among farmers emphasize the need for further investigation of farm women and depressive symptoms.

The overall purpose of this dissertation was to 1) explore the current state of the science of farm women and depressive symptoms and identify variables commonly associated with depressive symptoms among farm women, 2) identify variables influencing levels of depressive symptoms within farm women aged 50 and over and identify differences between those women with high depressive symptoms and those with low depressive symptoms, and 3) establish the reliability and validity of the 12-item John Henry Active Coping Scale (JHAC-12) within the sample.

A systematic review of the literature revealed that there is a need for more research with strong study designs regarding farm women and depressive symptoms within the context of their environment, culture, and occupation. The review identified multidimensional factors from farm women’s lives that influence their level of depressive symptoms. Farm women’s ethnicity, the agrarian culture, family and social relations, as well as specific demographics were identified as key variables associated with an increased risk of higher depressive symptoms. Because of the identification of the multidimensional factors, the use of the Modified Biopsychosocial Model (MBPS) was
selected as a framework for continued research as it depicts the interrelationship between the factors and their influence on farm women’s depressive symptoms.

The MBPS was applied to data from 358 farm women aged 50 and older from a larger cohort study, and a secondary analysis was performed. Multivariable binary logistic regression was used to identify those variables associated with depressive symptoms among farm women. Depressive symptoms were predicted by race/ethnicity, years of education, adequacy of income for vacation, perceived health status, perceived stress score, and active coping score. Significant differences between those farm women with low CES-D score (<16) and those with high CES-D score (≥16) were noted. Race/ethnicity, years of education, adequate income for vacation and retirement, reported health status of fair or better, perceived stress score, active coping score and satisfaction from farm work were all significant between groups. Women who were non-White, had less education, reported income not adequate for vacation or retirement, reported poor health, higher levels of perceived stress, lower levels of active coping and who were not satisfied with farm work were more likely to be in the high CES-D group.

A principal component analysis with direct oblimin rotation in a sample population of older farm women (n=458) identified two dominant themes of the JHAC-12: “commitment to hard work” and “self-efficacy.” The instrument component structure reflects the culture of the agrarian society. In the two-component solution, 2 items were removed from the scale after revealing low values of communality (<.3). The item reduction resulted in more refined scale, increasing explained variance by 4.1% with less items. Cronbach’s of the JHAC-12 (α = .78) and JHAC-10 (α = .76) indicated high levels of reliability for both scales. Rotation of the items resulted in a simple structure with high loadings within items, no major-cross-loadings and little correlation between components (r = .29), supporting both convergent and discriminant validity in this population. The ability of the JHAC to encompass the socio-culture aspects of active coping among farm women and obtain a quantifiable result supports the JHAC as an important tool to utilize in future studies of depressive symptoms and farm women with use of the JHAC-10 in future studies of farm women decreasing the burden of the participants.

Although there are limitations within each document, each section adds to the science of farm women and depression symptoms and provides directions for future research. The major gaps identified were: 1) the need for current research with stronger study designs, 2) studies of farm women across their life spans, 3) the need for focused studies among minority and migrant women, 4) an understanding of farm women and their leisure time, and 5) a broader application of the MBPS theory to include a large number of social variables shown to be associated with farm women and depressive symptoms that were not available in the dataset.

**KEYWORDS:** Farm women, Farm women and Depressive Symptoms, Mental Health of Farm Women, Depressive Symptoms, Rural Mental Health
Cheryl Dean Witt  
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May 6, 2019  
Date
DEPRESSIVE SYMPTOMS AMONG FARM WOMEN AGED 50 AND OLDER

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This dissertation is dedicated to my dad who, despite his lack of a son (until my own son came along) to work on the farm, let me work on the farm, regardless of the task. He has always loved, supported and believed in me. He constantly reminded me, “You can do anything you want to do. Doesn’t matter if you are a girl. Don’t let them tell you otherwise.”
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“I think a hero is any person really intent on making his a better place for all people.”

—Maya Angelou
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CHAPTER ONE

Introduction to Dissertation
Introduction to Dissertation

Background

Increasing rates of depressive symptoms and suicide among production farmers have caused a universal public health concern (Behere & Bhise, 2009; Burgard & Lin, 2013; Fraser et al., 2005). Unique aspects of farm life and farming contribute to higher rates of depressive symptoms among farmers and farm families (Burgard & Lin, 2013; Lunner et al., 2013). Higher levels of depressive symptoms lead to an increased risk of suicide, development of chronic disease, and increased risk of injury, and affect overall quality of life (Faragher, Cass, & Cooper, 2005; Trivedi, 2004; World Health Organization (WHO), 2010). The rates of depressive symptoms and their relationship to aspects of the farm environment are well documented (Burgard & Lin, 2013; Fraser et al., 2005; McIntosh et al., 2016; Roberts & Lee, 1993; Sanne, Mykletun, Moen, Dahl, & Tell, 2004), yet little is known regarding the effects of the farm environment on the mental health and well-being of farm women. Current research regarding depressive symptoms among farmers has largely focused on male farmers despite the increase of female farmers from 5.2% to 13.9% of principal farm operators in 2007 and the nearly 3.5 million farm women who may be potentially at risk for higher depressive symptoms (Hoppe & Korb, 2013; Student Action with Farmworkers (SAF), 2011; United States Census Bureau (USCB), 2017; Worldometers, 2018).

Unique aspects of farming and farm life can contribute to higher levels of depressive symptoms (Burgard & Lin, 2013; Guiney, 2012; Kearney, Rafferty, Hendricks, Allen, & Tutor-Marcum, 2014; Lunner et al., 2013; WHO, 2010). Economic volatility, governmental regulations, increased costs of machinery and production, as well
as occupational hazards of the agricultural environment contribute to stress and pressure felt by farmers (Behere & Bhise, 2009; Guiney, 2012; Kearney et al., 2014; WHO, 2010). This can be further complicated as farm work is usually performed at the site of the farmer’s residence, which serves as both the work-place and home where, often, the farmer is working with family members who share the burden of the farm work. Limited leisure time can add additional stress. The agrarian culture is one of strong work ethic and conservative views (Brandth, 2002; Herron & Skinner, 2012; Rosenfeld, 1985; Weller, 2017). Leisure time may occur when all of the work is done (Bolwerk, 2002). The lack of separation between work and family coupled with minimal leisure time disrupts work-life balance, often resulting in increased tension and anxiety, which contributes to higher levels of depressive symptoms (Chikani, Reding, Gunderson, & McCarty, 2005). In addition to these aspects of farm life, farm women can also be affected by stressors related to their gendered role within the agrarian culture.

The role of farm women in the patriarchal agrarian culture includes the gendered role of household maintenance, caring for family members, and preparing food, and with change in economics may include an off-farm job (Andersson & Lundqvist, 2014, Doss, 2011; Elliot et al., 2018). Farm women also make considerable contributions to the farm as a business. Typical activities include tending animals, producing crops, upkeep of the land, running errands, and keeping up with the ledger of the business (Andersson & Lundqvist, 2014; Doss, 2011; Reed, Westneat, Browning, & Skarke, 1999; Rosenfeld, 1985). The magnitude of the contribution of farm women to the farm may go unnoticed by the farm woman herself and other family members. The farm woman may self-identify as a farmer’s wife, assistant to the male farmer, or homemaker, minimizing her
involvement in the farm environment (Doss, 2011; Reed et al., 1999; Rosenfeld, 1985). The farm woman may believe she is expected to fulfil her part of the farm work on the family farm and is generally not paid for this. This may result in feelings of inadequacy or a lesser hierarchal status within the family structure (Dimich-Ward et al., 2004; Doss, 2011; Pryor, Carruth, & Lacour, 2005).

The results of multiple studies indicate that there are gender differences related to stress, coping styles, and prevalence of depressive symptoms (Angst et al., 2006; Gemmell et al., 2016; Kim, Cho, Hong, & Bae, 2015; Merecz & Andysz, 2014). Women in general are at a greater risk of a major depressive disorder than men and have a higher prevalence of depressive symptoms (Angst et al., 2006; Hildebrandt, Stage, & Kragh-Soerensen, 2003; Kessler, 2003; Kim et al., 2015; Smith et al., 2008).

The purpose of this dissertation was to: 1) explore the current state of the science of farm women and identify factors commonly associated with depressive symptoms in farm women, 2) identify variables that increase or protect farm women aged 50 and over from depressive symptoms, and identify differences between farm women with high and those with low depressive symptoms, and 3) establish the reliability and validity of the 12-item John Henry Active Coping Scale (JHAC-12) within a sample of older farm women aged 50 and over. These are written as 3 manuscripts, one addressing each purpose and are presented in Chapters Two through Four.

Summary of the Theoretical Framework and Model

Based on a review of literature, the risk factors influencing depressive symptoms of farm women are multidimensional with contributing factors of demographic, social, psychological, and environmental influences. Correspondingly, a modified version of the
Biopsychosocial Theory (BPS) was elected as the theoretical framework for this dissertation (Engel, 1977). The theory encompasses the multiple dimensions that influence farm women and depressive symptoms and provides a more holistic view of the inter-relationship of the influencing factors.

The BPS was developed by George Engel to provide a holistic approach to scientific inquiry (Engel, 1977). The theory considers the interactions between the environment, a person’s personality, behaviors, genetic susceptibility, and stressful events in evaluating the patient’s vulnerability to both physical and mental disease and wellness (Papadimitriou, 2017). The BPS has been applied as a theory in other public health populations. This is particularly true when one or more factors are related to the health behavior such as pain, obesity, smoking, alcohol use, and depression (Bruner, Davey, & Waite, 2011; Green & Johnson, 2013; Hildon et al., 2018; Leventhal, 2008; Rosenbaum & White, 2016; Smith et al., 2015). The use of the BPS and its applicability to behavior outcome is well-taken in relation to farm women and depressive symptoms as literature reveals factors of social, biological, environmental, and psychological dimensions to be associated with depressive symptoms in farm women (Hanklang, Kaewboonchoo, Morioka, & Plermpit, 2016; Rayens & Reed, 2014; Sanne et al., 2004; Stallones & Beseler, 2002; Booth & Lloyd, 2000; Alderete, Vega, Kolody, & Aguilar-Gaxiola, 1999; Stallones, Leff, Garrett, Criswell, & Gillan, 1995; d’Epinay, 1985). The modified BPS (MBPS) (see Figure 1.1) conceptual model provides a more detailed insight into the farm woman and the factors that are associated with depressive symptoms.
Chapter Overviews

Overview of Chapter Two

The first manuscript is a systematic literature review conducted to assess the current state of the science of farm women and depressive symptoms as well as identify factors associated with depressive symptoms in farm women. The review revealed multidimensional factors which may increase farm women’s risk of higher depressive symptoms. The review also suggested factors associated with farm life that protect farm women from higher depressive symptoms. Gaps in the literature were identified regarding lack of current available research and the need for stronger study designs specific to farm women and depressive symptoms. The review indicated a need of further investigation of farm women and depressive symptoms within the context of their environment, culture and occupation. The knowledge obtained will provide information to identify appropriate resources and design evidence-based programs to decrease depressive symptoms among farm women.

Overview of Chapter 3

In the review of the literature multifaceted, interrelated variables were identified that are associated with higher depressive symptoms among farm women; therefore, an MBPS was adapted as a theoretical model. The MBPS was used to guide the exploratory secondary analysis to predict the multidimensional influences from farm women’s social, psychological, biological, environmental, and demographic aspects shown to affect farm women’s levels of depressive symptoms.

Chapter 3 identified that older farm women’s depressive symptoms were predicted by their race/ethnicity, years of education, adequacy of income for vacation, perceived health status, perceived stress level score, and active coping score. Gaps
identified included a lack of research on migrant farm women and other minority farm women, leisure time among farm women, and depth of current studies related to variables affecting their depressive symptoms. 

**Overview of Chapter 4**

The research focusing on farm women and depressive symptoms is limited. One factor that may contribute to this limitation is the unavailability of valid and reliable instruments for this population. The JHAC-12 is an instrument that has been used to measure a form of active coping known as *John Henryism*; active coping in the presence of undesirable socio-cultural circumstance (Fernander, et al., 2005; James et al., 1983). The instrument not only incorporates the socio-cultural but also intrapersonal effects, such as positive attitude, on the individual’s coping (James et al., 1987). The JHAC-12 has been used in studies with populations that experience significant hardships. The instrument can be used in studies of the agricultural community to help us better understand depressive symptoms within the context of the agrarian culture. However, while it has been widely used in a variety of populations (Bennett et al., 2004; Fernander, Duran, Saab, Llabre, & Schneiderman, 2003, Fernander et al., 2005; Haritatos, Mahalingam, & James, 2007; James, 1994; Li, 2008; Logan, Barksdale, & Chien, 2014; Maciuba, Westneat, & Reed, 2013; Markovic, Bunker, Ukoli, & Kuller, 1998; Watson, Logan, & Tomar, 2008), only one study has tested the psychometric properties of the JHAC-12 (Fernander et al., 2005) and to the best of knowledge, no published study has tested the properties within a population of older farm women. In Chapter 4 the reliability and validity of the JHAC-12 in a sample of 358 older farm women is evaluated.
Similar to the agrarian culture, the JHAC-12’s three major themes are: 1) mental and physical vigor, 2) a strong commitment to hard work, and 3) a single-minded determination to succeed (James, 1994). Principal Component Analysis (PCA) with oblimin rotation supported a 2-component, 10-item JHAC tool (JHAC-10) with 8 items (>0.4) loading onto Component 1 “commitment to hard work” and 2 items loading strongly (>0.7) onto Component 2 “self-efficacy.” Rotation of the items resulted in a simple structure with high loadings within items, no major-cross-loadings and little correlation between components (r = .29), supporting both convergent and discriminant validity in this population. Reliability of both the JHAC-12 and the JHAC-10 revealed high levels of internal consistency for the items with acceptable levels of reliability of α=.78 and α=.76 respectively. The 2 dominant themes of the final components reflect the agrarian culture, supporting face validity of the scale within the sample of older farm women.

Results support the use of the JHAC-12 or the JHAC-10 as a valid and reliable instrument to use in future studies of older farm women. Its ability to encompass the sociocultural influences on the active coping of farm women as well as the ability to quantify the variable should establish the importance of its use in future research of farm women and depressive symptoms.
Figure 1.1 MBPS Conceptual Model in Relation to Farm Women and Depressive Symptoms
CHAPTER TWO

Depressive Symptoms among Farm Women: A Systematic Review
Abstract

Background: In the U.S., rates of suicide and depression are highest among the agriculture, fishing and forestry industry, with alarming rates among production farmers. High rates of depressive symptoms can increase the risk of injury, development of chronic illness, and suicide. Academic research regarding depression among farmers has moved to the forefront; however, these studies largely focus on the male farmer. There are approximately 3.5 million U.S. farm women, including 500,000 migrant farm women, who may be at risk for increased depressive symptoms; hence the urgency to provide current research to assess prevalence rates, key predictors, and protectors of depressive symptoms among this population.

Objective: To systematically review the research findings in order to assess the state of the science of farm women and depressive symptoms and to determine key variables associated with depressive symptoms in farm woman.

Data Sources: A key word literature search was conducted using articles listed in PubMed, EBSCO HOST Academic Search Complete, Agricola, CINAHL, MEDLINE, Psychology and Behavioral Sciences Collection, PsycINFO, and Sociological Collections as well as two major search engines, Google and Google Scholar.

Study Selection: To be included in the review, articles needed to be a) peer-reviewed, b) available in the English language, c) at least a minimum of methodological and statistical methods is described, d) the prevalence and/or incidence of depressive symptoms regarding farm women is discussed, e) variables associated with depressive symptoms is discussed, f) the participants reside on a farm or live in a migrant farmworker household, and g) level of depression or depressive symptoms is measured with a validated tool. As it was anticipated minimal academic literature would be available, both qualitative and
quantitative article and all dates of available literature were considered. Thirteen articles met the inclusion criteria.

**Data Synthesis:** Leading predictors of higher depressive symptoms included increased family conflict, single, poor health, financial hardship, discrimination, lack of social support, and variables associated with farming as an occupation. Two studies reported living on the farm as a protective factor of higher depressive symptoms. Discrepancy was noted between studies reporting age as variable of association in both younger and older farm women. Discrepancy was noted between studies regarding prevalence with some studies reporting lower rates while others reported higher rates. Higher prevalence of depressive symptoms was reported among migrant farm women when compared to White non-Hispanic farm women and non-farm resident women.

**Conclusion:** There is limited available, current research on the topic of depressive symptoms and farm women. Variables identified as associated with depressive symptoms were multi-faceted; however, none of the studies was comprehensive enough to include all variables identified, particularly those associated with farming as an occupation and social variables. The results are indicative of the need for further research to add to the knowledge of depressive symptoms in farm women. The increase in the knowledge will provide information to identify appropriate resources and design evidence-based programs to decrease depressive symptoms among farm women.

*Keywords:* farm women, depression, depressive symptoms, mental health
Depressive Symptoms among Farm Women: A Systematic Review

Background

The agriculture industry has one of the highest rates of suicide and lifetime risk for major depression compared to other occupations (Fraser et al., 2005; McIntosh et al., 2016; Roberts & Lee, 1993; Sanne, Mykletun, Moen, Dahl, & Tell, 2004). In addition to increased risk of suicide, higher rates of depressive symptoms are associated with development of chronic disease and somatic symptoms such as joint pain, gastrointestinal problems, and sleep disturbances, which can further exacerbate depressive symptoms, decrease quality of life, and increase risk of injury and accidental or premature death (Faragher, Cass, & Cooper, 2005; Trivedi, 2004; World Health Organization (WHO), 2010). While depression among women has been studied in depth, and research is available on farm men and depression, few studies have focused on farm women and depressive symptoms.

Farm families comprise 2% of the U.S. population (American Farm Bureau Foundation (AFBF), 2017). Considering that approximately half the U.S. population is married, and the U.S. population is 326,544,439 as of May 2018, there are likely approximately three million farm women in the U.S. (United States Census Bureau (USCB), 2017; Worldometers, 2018). There are also an estimated 2.5 million migrant farm workers in the U.S.; approximately 20% are women (Student Action with Farmworkers (SAF), 2011). The current statistics indicate 3.5 million farm women who may be affected by this public health epidemic of depressive symptoms.

Aspects of farm life may contribute to higher levels of depressive symptoms among farm families. Farming stressors include high governmental regulation, physically
demanding work with seasonally long work hours, and income that depends on unpredictable weather conditions and crop or animal disease (Guiney, 2012; WHO, 2010). Farm women can be further affected by these factors where traditional gender roles hold true. As Rosenfeld (1985) stated, “Women do men’s work on the farm as necessary, but men do not ordinarily do women’s work.” (p.11). Many farm women have found it necessary to seek off-farm employment to supplement declining incomes in addition to performing their usual household duties, helping with seasonal tasks and tending to other family needs (Perry, 1994). This type of multi-tasking may cause additional distress as farm women are conflicted between the traditional role of homemaker and wife and the necessity of an off-farm income.

Limited research focusing on farm women and depressive symptoms, coupled with the large number of women at risk, indicates an urgent need for further investigation of this public health issue. The purpose of this literature review was to determine the state of the science regarding farm women and depressive symptoms and identify variables associated with depressive symptoms in farm woman.

**Methodology**

Electronic databases employed in this research included PubMed, EBSCO HOST Academic Search Complete, Agricola, CINAHL, MEDLINE, Psychology and Behavioral Sciences Collection, PsycINFO, and Sociological Collections. In addition, search engines (i.e. Google Scholar and Google) were used to identify relevant literature sources based on the keywords “farm women” AND “depression” as well as “farm women” AND “depressive symptoms,” “mental health of farm women” and “mental health AND farm women”. “Depression” and “mental health of farm women” were included as related
terms of “depressive symptoms”. As previous research largely focused on depressive symptoms and the male farmer, it was anticipated minimal academic literature would be available on the same topic as it related to farm women; therefore, both qualitative and quantitative articles were considered as well as articles published with dates prior to the last 10 years. Inclusion criteria for articles to be retained for final review were: a) peer-reviewed, b) available in the English language, c) at least a minimum of methodological and statistical methods is described, d) the prevalence and/or incidence of depressive symptoms regarding farm women is discussed, e) variables associated with depressive symptoms is discussed, f) the participants reside on a farm or live in a migrant farmworker household, and g) level of depression or depressive symptoms is measured with a validated tool. In addition, reference lists and lists of related articles were checked for possible additional articles.

A total of 10 searches were conducted utilizing the databases with key words and/or phrases. Search engines produced a plethora articles with Google and Google Scholar producing the majority of articles. Google and Google Scholar; however, included not only peer-reviewed articles, but also other written articles on farm women and depressive symptoms as well as patents and citations. Each of these engines was searched until a minimum of five pages yielded no new potential articles. Articles that were not peer-reviewed and patents or citations were discarded. Titles and abstracts were reviewed to identify potential articles.

**Results**

The search of the databases yielded 1013 articles with a total of 730 articles identified from Google Scholar and 160 from Google. The search of the remaining
databases (PubMed and EBSCO HOST) resulted in identification of 123 articles. After 155 duplicate articles were removed, 858 articles were screened, 800 of which were excluded. Those excluded were largely because in the article only the consequences of depression or one major cause of depression in farmers was discussed. This reduction left 58 articles to assess for final review.

After a detailed assessment, only 13 articles met the inclusion criteria and were retained for final review. Many of the potential articles focused on rural women rather than farm women, grouped psychological conditions other than depressive symptoms or mental disorders with depressive symptoms and/or did not use a validated tool to measure levels of depressive symptoms and were excluded. Figure 2.1 displays the Preferred Reporting Items for Systematic Reviews and Meta Analyses (PRISMA) diagram of the search (Moher et al., 2009).

The 13 articles retained for final review were representative of farm women from geographic, ethnic and age perspectives with four articles focused on migrant farm women. The majority of the articles (n=11) included both farm men and women while two were focused exclusively on farm women.

The articles are discussed based on strengths, weaknesses, results, and several factors specific to farm life and women likely to increase the risk of depression. Table 2.1 summarizes the articles by date of publication from most recent to oldest and lists statistically significant epidemiological findings from each as well as prevalence of depressive levels of farm women. The migrant worker studies are separated from the remaining articles and are also arranged by publication date.
Study Designs and Sample Size

Of the 13 studies, 12 are cross-sectional and one longitudinal. Two cross-sectional studies used mixed methods and provided qualitative and quantitative data (d’Epinay, 1985; Hovey & Magana, 2002). Dates of publication ranged from 1985 to 2016. Five of the 13 articles were published within the last 10 years (Hanklang, Kaewboonchoo, Morioka, & Plernenpit, 2016; Pulgar et al., 2016; Rayens & Reed, 2014; Roblyer et al., 2016; Torske, Hilt, Glasscock, Lundqvist, & Krokdast, 2016;). Booth and Lloyd (2000) reported the smallest sample size at 32, and Hanklang et al. (2016) had the largest sample at 588.

Validity and reliability were documented in 10 of the articles. Merchant et al. (2002) performed a power analysis to ensure adequacy of sample size. Four of the studies randomly selected participants (Booth & Lloyd, 2000; d’Epinay, 1985; Merchant et al., 2002; Stallones & Beseler, 2002). Merchant et al. (2002) ensured population representation by performing a post numeration survey of randomly selected non-participant households. Six authors trained interviewers and, where applicable, translated tools to measure depressive symptoms into the native language of farm women (Alderete, Vega, Kolody, & Aguilar-Gaxiola, 1999; Hanklang et al., 2016; Hovey & Magana, 2002; Pulgar et al., 2016; Roblyer et al., 2016).

Ethnic and Geographical Representation

In the retained articles, there is a balance of geographical and ethnic backgrounds. The focus population in five of the 13 final articles is from areas other than the U.S. Those from the U.S. represented three geographic regions. Three of these articles
surveyed farm women from the far Western U.S., two from the Midwest, and the remaining three from the Southeastern U.S.

All participants from the four migrant studies were Latina or Mexican migrant farmworkers (Alderete et al., 1999; Hovey & Magana, 2002; Pulgar et al., 2016; & Roblyer et al., 2016). Five of the remaining studies included participants from countries other than the U.S., including Hanklang et al.’s (2016) study of Thai rice farmers, Sanne et al.’s (2004) and Torske et al.’s (2016) studies of Norwegian farmers, d’Epinay’s (1985) analysis of Swiss mountain farmers, and Booth and Lloyd’s (2000) study of Southwest England. In the studies in which samples came from native U.S. populations, the samples ranged from Merchant et al.’s (2002) minimum of 80% of Caucasian representation to Stallones, Leff, Garrett, Criswell, and Gillan’s (1995) maximum of 99% Caucasian.

**Gender Representation**

Two studies from the final review focused on females only; both were migrant worker studies (Pulgar et al., 2016; Roblyer et al., 2016). Of the remaining 11 studies, all except one, Booth and Lloyd (2000), had relatively equal representation of gender.

**Measures of Depression**

All 13 studies used a validated tool to measure levels of depression or depressive symptoms, such as the Center for Epidemiological Studies-Depression (CES-D) and the Hospital Anxiety and Depression Scale (HADS-D); d’Epinay (1985) utilized the Wang-Self-Assessing Depression Scale (Wang-SADS). Eleven of the 13 final articles discussed reliability of the tool within their population. Booth and Lloyd (2000) and d’Epinay (1985) did not discuss reliability of their respective depressive symptom tool. Four
studies reported Cronbach alpha of the CES-D within the sample population, with values ranging from 0.75 to 0.84 (Hovey & Magana, 2002; Pulgar et al., 2016; Rayens & Reed, 2014; Roblyer et al., 2016). Seven of the 13 referred to reliability of their respective tool by referencing analysis of the tool in similar population samples (Alderete et al., 1999; Hanklang et al., 2016; Merchant et al., 2002; Sanne et al., 2004; Stallones & Beseler, 2002; Stallones et al., 1995; Torske et al., 2016).

**Prevalence**

Prevalence of depressive symptoms scores ranged from a low of 3% (Sanne et al., 2004) to a high of 44% (d’Epinay, 1985). The average prevalence rate of depressive symptoms among farm women reported in all articles is 24%.

**Factors Associated with Depression in Farm Women**

**Family.** Family problems or conflict were shown to be associated with higher depressive symptoms in two of the migrant worker studies as well as three of the remaining studies (Booth & Lloyd, 2000; d’Epinay, 1985; Hovey & Magana, 2002; Roblyer et al., 2016; Torske et al., 2016). This also includes the theme from one qualitative study stating, “having a bad husband” and its association with mountain farm women’s high levels of depression (d’Epinay, 1985). Additionally, the “lack of interest of family talking with me” was associated with higher levels of depression in one study (Hanklang et al., 2016, p.88). Rayens and Reed (2014) also found women’s level of depressive symptoms to be positively associated with the stress of the spouse, as well as the amount of time the spouse spent working on the farm.

**Health conditions.** Five of the studies reported health status to be associated with depressive symptoms (Booth & Lloyd, 2000; d’Epinay, 1985; Rayens & Reed, 2014;
Sanne et al., 2004; Stallones & Beseler, 2002). The “number of health conditions,” and health status perceived as “fair” or “poor health” and “failing health,” were terms found to be significantly associated with higher depressive symptom scores in the five studies. Diagnoses of pesticide poisoning and anxiety were also associated with higher rates of depressive symptoms (Alderete et al., 1999; Stallones & Beseler, 2002). “Having ever smoked” was associated with higher rates of depressive symptoms in one study (Merchant et al., 2002).

**Social support.** Lack of social support, not being accepted into the community, and racial or ethnic discrimination were significantly associated with depressive symptoms in three of the four migrant workers studies, as well as the Thailand rice farmers study (Alderete et al., 1999; Hanklang et al., 2016; Hovey & Magana, 2002; Roblyer et al., 2016). High acculturation and high acculturative stress were associated with depressive symptoms in two of the four migrant worker studies (Hovey & Magana, 2002; Alderete et al., 1999). Legal status and language conflicts were significantly associated with symptoms in one study of migrant workers (Alderete et al, 2000). “Agreement to the migrant lifestyle” was significantly associated in another migrant study (Hovey & Magana, 2002). The variables of “social support,” “being accepted into the community,” “discrimination,” “acculturation,” “acculturative stress,” “legal status,” or “language conflicts” were not a focus in the non-migrant worker studies with the exception of one (Hanklang et al., 2016).

**Financial hardship.** Three studies confirmed the association of financial difficulties and depressive symptoms. These included financial hardship, income reduction or economic insecurity (Hanklang et al., 2016; Roblyer et al., 2016; Stallones
Additionally, one migrant study reported association with food insecurity and depressive symptoms among farm women, but not financial hardship (Pulgar et al., 2016).

**Gender.** Among the 13 studies, 11 samples included both genders with only two of the 11 reporting gender (female) to be significantly associated with higher depressive scores (Stallones & Beseler, 2002; Stallones et al., 1995). Four of these 11 studies did not segregate data analysis by gender when listing variables significantly associated with depressive symptoms; however, they did discuss prevalence of depressive symptoms by gender (Booth and Lloyd, 2000; Hovey & Magana, 2002; Stallones & Beseler, 2002; Stallones et al., 1995).

**Age.** Two studies, one migrant (Alderete et al., 1999), and one with a population sample representation of 98.8% White, non-Hispanic (Stallones and Beseler, 2002), found younger age to be associated with depressive symptoms, while Torske et al., (2016) found increasing age to be significantly associated. All of the studies except one (Booth & Lloyd, 2000) had a large number of participants (>300). The range of ages over all 13 studies was 18-89 years; however, variability was noted between studies, with some samples having a wide variety of ages, and others less variability and a largely older or largely younger sample. Six studies had a wide variety of ages with an average span of 18- >65 years (Hanklang et al., 2016; Hovey & Magana, 2002; Merchant et al., 2002; Stallones & Beseler, 2002; Stallones et al., 1995; Torske et al., 2016). Five studies had less variability in age range and a younger sample when compared to other studies with a narrow range of ages. This included the following age ranges: 40-49 years (Sanne et al., 2004), 30-39 years (Booth & Lloyd, 2000), 18-45 years (Pulgar et al., 2016), 18-35
years (Roblyer et al., 2016), and 18-59 years (Alderete et al., 1999). Two studies had narrower ranges and an older sample when compared to the 5 studies with less variability. Rayens and Reed (2014) reported a sample age range of 50-89 years, and d’Epinay (1985) reported a sample age of 65 or older.

**Education.** Education was included as a variable in 10 of the final 13 studies; however, only Hovey and Magana’s (2002) migrant study associated lower educational levels with higher symptoms of depression.

**Farming as an occupation:** Four of the studies mentioned factors associated with depressive symptoms that directly dealt with the occupation of farming (Hanklang et al., 2016; Rayens & Reed, 2014; Sanne et al., 2004; Stallones et al., 1995). Occupational health hazards such as loud machinery noise, being diagnosed with pesticide poisoning, living on the farm and without being actively involved, and working on the farm but not getting paid were associated with higher depressive scores. One qualitative study also mentions “too harsh a life” (d’Epinay, 1999, p. 603). Rayens and Reed (2014) found that job satisfaction from farm work was inversely associated with depression scores among their sample of 494 farm women age 50 and over.

**Discussion**

This review provides data supported by previous studies and identifies potential gaps in the knowledge of prevalence as well as identifies predictors and protectors of depressive symptoms among farm women. The gaps suggest additional variables to incorporate into theoretical models to decrease depressive symptoms among farm women.
Prevalence

While all 13 studies utilized a validated measure of depressive symptoms (CES-D, HADS-D, Wang-SADS), prevalence variance in scores was noted. The variance may be explained by comparing populations where different tools were utilized, in comparing prevalence based on different cut-off scores or by characteristics of the population sample.

The CES-D is a depression symptom scale with good sensitivity and specificity and high internal consistency (Lewinsohn, Seeley, Roberts, & Allen, 1997; Radloff, 1977). The instrument has been utilized and tested in different ages and ethnic backgrounds (Lewinsohn et al., 1997; Frerichs, Aneshensel, & Clark, 1981; Hovey, 2000). The CES-D score range for mild to moderate depression is 15-21; scores over 21 are considered for possibility of major depression (Counselling Resource, 2018). Of the nine studies that utilized the CES-D, Merchant et al. (2002) based prevalence rates on scores >8, while two others based rates on scores >10 (Pulgar et al., 2016; Roblyer et al., 2016). This makes comparing prevalence scores to those who used the cut point of 15 or greater problematic.

The HADS-D tool was originally designed as a depression screening tool for medical practice, but has been tested for reliability and validity in public health (Snaith, 2003). A cut-off level of ≥8 has been shown to provide optimal sensitivity and specificity (Bjelland, Dahl, Tangen, & Neckelmann, 2002). Authors utilizing the HADS-D used the optimal cut-off level of 8 (Torske et al., 2016; Sanne et al., 2004; Merchant et al., 2002; Booth & Lloyd, 2000).
Although not as commonly used in research, The Wang-SADS was designed for measuring depressive symptomology. The instrument has been evaluated in very few studies (Guilley et al., 2005; Wang, Treul, & Alverno, 1975).

While all of the depressive symptom tools have been validated, comparison of prevalence rates between the articles utilizing different tools may pose issues. Comparison studies between the CES-D and HADS-D show no differences in accuracy for measuring depressive symptoms, but caution should be used when comparing Wang-SADS with CES-D and HADS-D (Stafford et al., 2014; Krebber et al., 2013).

In comparing those studies utilizing the CES-D and HADS-D with respective optimal cut-off levels, there was little variance noted except in three of the migrant farm worker studies and among the Thai rice farmers (Hanklang et al., 2016; Hovey & Magana, 2002; Pulgar et al., 2016; Roblyer et al., 2016). While previous studies support migrant farm workers’ increased risk for depressive symptoms, migrant farm women’s prevalence rates may have been lower had the optimal cut-off number for the depressive tool been used (Pulgar et al., 2016; Roblyer et al., 2016). Alderete et al. (1999) utilized the optimal cut-off rate in migrant farm women with a result of 20% prevalence. This figure is at the prevalence rate of the general female public (American Psychological Association (APA), 2018; Bhatia & Bhatia, 1999; Kessler, McGonagle, Swartz, Blazer, & Nelson, 1993; Kornstein, 1997). Pulgar et al. (2016) gave no reference to their statement that “a score of 10 or more was considered indicative of significant depressive symptomology.” (p. 4). Roblyer et al. (2016) referenced a second study (Grzywacz, Hovey, Seligman, Arcury, & Quandt, 2006) that reported using a short version of the
CES-D and using the cut-off of 10; however, there was no statement of reliability or validity within the second study.

Further explanation of prevalence differences may be a result of variability of age within the sample, age of sample population surveyed, geographic region of sample or the composition of the ethnic groups within the sample. It is also possible that women, in general, seek treatment or report depressive symptoms more often than men report (Acciai & Hardy, 2017; Barsky, Peekna, & Borus, 2001).

Farm women in the studies reviewed here, with the exception of those migrant worker studies previously discussed, indicate a prevalence rate at or below women in the general population. Women in the general population have a lifetime prevalence rate of depression of 20%, with depression in women occurring at an earlier age, lasting longer, and occurring more frequently with stressful life events (Bhatia & Bhatia, 1999; Kessler et al., 1993; Kornstein, 1997). This suggests that there may be factors about farm life that protect farm women from higher levels of depressive symptoms. Migrant workers are likely to experience higher levels of discrimination and lack of social support, although neither discrimination nor social support was a focus in studies other than the migrant workers studies.

**Family**

Family dynamic plays a major role in the level of depressive symptoms. Five of the studies reviewed, including two of the migrant studies, supported previous research indicating family conflict and lack of family contact contributes to depressive symptoms (Booth & Lloyd, 2000; Chou, Liang, & Sareen, 2011; d’Epinay, 1985; Hanklang et al., 2016; Hovey & Magana, 2002; Roblyer et al., 2016). The agrarian culture is
characterized by a distinct set of values: self-reliance, strong family unit, strong work ethic, attachment to the family farm, independence, fundamentalism, and traditional gender roles (Brandth, 2002; Kelly & Shortall, 2002; Logsdon, 1994; Peck, Grant, McArthur, & Godden, 2002; Swisher, Elder, Lorenz, & Conger, 1998). The farm woman’s role identity is also one of social identity in which one compares self to the norm of the culture. Perceived inadequacy to meet expectations of the norm may result in increased stress and anxiety (Herron & Skinner, 2012; Kelly & Shortall, 2002; Marks & MacDermid, 1996). Role identity is conflicted as farm women struggle to maintain household chores, care for the family, and work on the farm when there aren’t enough employees or employees are not affordable but recognize that the farm work needs to get done. These conflicts may be further complicated when women have off-farm jobs, which can lead to conflict within the family unit (Herron & Skinner, 2012; Kelly & Shortall, 2002; Thurston, Blundell-Gosselin, & Rose, 2003).

Additional stress is added as farm women not only worry about potential injury to self but the well-being of those in the family as work is performed on the farm. This finding is supported by Rayens and Reed (2014), who found the positive relationship between the husband’s time spent on the farm and spouse’s stress level to be predictors of higher depressive symptoms in farm women.

**Health Conditions**

In the studies reviewed here, most of the farm women self-reported their health as good. However, failing health, poor health, or a higher number of health conditions were significantly associated with depressive symptoms in this review. Within a culture that emphasizes a strong work ethic, poor health may also include becoming unable to work
or pull one’s share, resulting in distress for farm women (Brandth, 2002; Kelly & Shortall, 2002). Living in a rural community may mean decreased anonymity in seeking health care, as well as lack of access to health care providers (Booth & McLaughlin, 2000; Groh, 2013; Hillemeier, Weisman, Chase, & Dyer, 2008). Access to healthcare providers may be limited by availability of practitioners and transportation issues. In a migrant population, cultural issues, language barriers, and discrimination may further compound access issues, all of which may exacerbate psychological distress (Alderete et al., 1999 & Hovey & Magana, 2002; Pulgar et al., 2016; Roblyer et al., 2016).

**Demographics**

Specific demographics were also shown to be predictors of depressive symptoms in farm women. Despite financial hardship and education level being commonly associated with higher levels of depressive symptoms, only Hanklang et al. (2016), Roblyer et al. (2016), and Stallones and Beseler (2002) found economic difficulty to be significantly associated with depressive symptoms in farm women, while lower education level was significant in only one migrant study (Hovey & Magana, 2002). When including financial hardship as a variable, Pulgar et al. (2016) found food insecurity to be statistically associated with depressive symptoms in migrant farm women, but not financial hardship. Financial hardship and socioeconomic status have been shown in other studies as significant predictors among the general population and farm women (Arias-de la Torre, Vilagut, Martin, Molina, & Alonso, 2018; Butterworth, Olesen, & Leach, 2012; Hanklang et al., 2017; Roblyer et al., 2016; Stallones & Beseler, 2002). It is curious that migrant women who potentially live in substandard conditions and work for
low wages would have food security significantly associated with depressive symptoms over financial security.

There were no conflicting articles regarding marital status (single) and its relation to depressive symptoms. Age as a predictor had conflicting evidence between three of the final articles (Alderete et al., 1999; Stallones et al., 1995; Torske et al., 2016).

Torske (2016) associated increasing age with depressive symptoms while Alderete et al. (1999) and Stallones et al. (1995) found younger age to be significant. Discrepancies about the role of age are noted in other studies; for example, Carruth and Logan (2002) discussed older farm women experiencing more depression, but age was not a significant predictor in their study of 657 Louisiana women. Several studies found that depression in women can occur at an earlier age and younger farm women are more likely to suffer stress than older women (Aneshensel, 1985; Bhatia & Bhatia, 1999; Kornstein, 1997), while Thurston et al. (2003) discussed how women aged 30-59 report more stress, with the peak of respondents in the 30-39 age group.

**Farming as an Occupation**

It appears as farm women are not immune to the stressors of farming regardless of their role on the farm. Many of the same occupational variables associated with higher depressive symptoms among male farmers were identified as associated with depressive symptoms among farm women (Beard et al., 2013; Beseler et al., 2006; Labrash et al., 2008; Onwuameze, Paradiso, Peek, Donham, & Rautiainen, 2013; Rehner, Kolbo, Trump, Smith, & Reid, 2000; Sanne et al., 2004). This is supported in previous literature regarding stressors and strains unique to farming negatively affecting all members of the farm family (Carson et al., 1994; Kolstrup et al., 2013).
Some aspects of farm work are protective of higher depressive symptoms. Living on the farm and being actively engaged in farm work, as well as satisfaction from farm work, were inversely related to levels of depressive symptoms (Rayens & Reed, 2014; Stallones et al., 1995). These protective factors are supported in other studies and may be a result of cultural, environmental or combination of influences. Hillemeier et al. (2008) discussed residing on the farm as a protective factor against depression, while Amshoff and Reed (2005) mention the influence of farm tasks as protective. Farm work can be a source of pride and satisfaction as evidenced by a farmer’s statement, “If you are doing it because you want to, then it’s not considered work.” (Amshoff & Reed, 2005, p. 306).

Gaps in the Research

There are several limitations in the available research. Among these is the fact that most studies conducted to-date have been primarily cross-sectional in design. Although cross-sectional studies are relatively quick and are good for descriptive analyses, causation cannot be determined. Another limitation is that much of the data has been collected by means of self-report surveys. Self-report of depressive symptoms is likely to result in an underestimation of prevalence of symptoms (Hadaway & Marlar, 2005; Prince et al., 2008). Additionally, those studies utilizing different validated tools for measuring depressive symptoms and/or use of different cut-off values of the same tool made comparison of studies problematic.

There are also sampling limitations. Among these are variability in age and gender. Regarding age, Merchant et al. (2002) had an over-representation of a generally younger age group that may have affected their study results. On the other hand, Reed and Rayens (2014) reported on women age 50 and older, and d’Epinay (1985) studied
women older than 65 years. Booth and Lloyd (2000) had over-representation of farm men (n=278) in their study with only 38 farm women, potentially skewing results.

**Future Implications**

There is a need to perform more research in studies with strong study designs on the topic of depressive symptoms among farm women as current research is minimal and those available have several limitations. Future studies should represent an equal distribution of ethnicity, age and geographic location and include a broader range of variables.

A longitudinal study of farm women and depression is necessary. The studies presented here do not explain the effects of specific stressors over a duration of time nor the intensity of specific stressors over the lifespan of farm women. This review also suggests the need of valid and reliable tools with use standardized cut-off for future comparative studies. This should provide a clearer understanding of prevalence rates among farm women within age groups and further define variables associated with depressive symptoms in the population.

There are many factors which may increase farm women’s risk for higher depressive symptoms. The factors are multidimensional in nature. Farm women’s ethnicity, the agrarian culture, family and social relations, as well as specific demographics are associated with an increased risk of higher depressive symptoms. Additionally, there were some factors identified protecting farm women from higher depressive symptoms.

There are an estimated 500,000 migrant farm women in the U.S. (SAF, 2011). Certain variables were shown to be specific to identifying depression in this vulnerable
population. Lack of social support, discrimination, acculturation stress, and language barriers have been associated with increased depressive symptoms among the migrant workers. Continued research on the effects of these factors, as well as potential interventions to address them, remains important; however, investigation of these same factors in White, non-Hispanic and African American farm women should be considered. The studies reviewed here did not address these same issues among populations other than the Hispanic migrant workers.

The identification of protective factors from depression in farm women indicates the need for a strength-based study to focus on the strengths of farm women and the variables that shield them from depressive symptoms (Hammond & Zimmerman, 2018). In many cases, farm women had lower depression rates than the general public, perceive their health positively and evidence was presented suggesting that living on the farm can be mentally healthy for women. A clue to this protective variable may be found in the study by Rayens and Reed (2014) discussed above as the authors reported satisfaction with farm work as inversely related to depressive symptoms as well as other factors associated with farming and farm life (Amshoff and Reed, 2005; Hillemeier et al., 2008). What role does job satisfaction play in the depression of farm women? What are other variables are protective of farm women and depression? While not noted as a predictor, levels of resiliency and/or coping could also provide additional insight.

There is potential for intervention studies to include knowledge enhancement for farm women regarding the definition of depression versus stress, when to report symptoms to avoid delay in treatment, and identifying access to mental health care. This may be particularly significant in the migrant worker community where access to health
care may be minimized or language barriers exist. Opportunities exist to establish support groups and/or education within the community or church family.

**Future Implications**

The major question of this literature review is determining what role gender plays within the agrarian culture on depressive symptoms. Researchers need more information regarding farm women within the context of environment, culture, and occupation. This knowledge will provide information to identify appropriate resources and design evidence-based programs to decrease depressive symptoms among farm women.
Table 2.1  Results of Final Analysis of Retained Articles for Review

<table>
<thead>
<tr>
<th>Author(s)/Publication Year</th>
<th>Study design</th>
<th>When</th>
<th>Location</th>
<th>Sample Size</th>
<th>Depression Instrument</th>
<th>Prevalence</th>
<th>Variables identified as associated with depressive symptoms</th>
</tr>
</thead>
</table>
| 1. Hanklang et al., 2016    | Cross-sectional | 2014          | Thailand               | 1047 rice farmers, age ≥ 20, 588 women | CES-D                 | 48%, based on CES-D score ≥16 | 1) Loud machine noise  
2) Being accepted in the community  
3) Interest of family talking with me  
4) Work-related financial hardship                                                                                     |
| 2. Torske et al., 2016      | Cross-sectional | 2006-2008     | Norway                 | 1417 farmers, ages 19-66, 317 women  | HADS-D                | 8%, based on HADS-D score ≥ 8 | 1) Increasing age                                                                                                               |
2) Perceived stress  
3) Number of health conditions  
4) Husband’s time spent on the farm  
5) Husband’s stress                                                                                                        |
| 4. Sanne et al., 2004       | Cross-sectional | 1997-1999     | Western Norway         | 917 farmers, ages 40-49, 344 women   | HADS-D                | 13%, based on HADS-D score ≥ 8 | 1) Less opportunity to use one’s abilities on farm  
2) Less paid work hours per week                                                                                             |
| 5. Merchant et al., 2002    | Longitudinal  | 1994-1998     | Keokuk County, Iowa    | 573 farmers, ages 18-65, 283 women   | CES-D                 | 20%, based on CES-D score >8 | 1) Ever smoked                                                                                                                 |
2) Gender (female)  
3) Perceived fair or poor health  
4) Income reduction  
*Not segregated by gender                                                                                                 |
2) Ill health  
*Not segregated by gender                                                                                                      |
Table 2.1 Continued

<table>
<thead>
<tr>
<th>Author(s)/Publication Year</th>
<th>Study design</th>
<th>When</th>
<th>Location</th>
<th>Sample Size</th>
<th>Depression Instrument</th>
<th>Prevalence</th>
<th>Variables identified as associated with depressive symptoms</th>
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</table>
| 8. Stallones et al., 1995   | Cross-sectional | 1993       | Colorado              | 872 farm residents, ages 20-84, **402 women** | CES-D               | 11% , based on CES-D ≥16 | 1)Living on the farm and not actively involved with farm work  
2)Younger age  
3)Being female  
4)Poor physical health  
5)Unmarried  
*Not segregated by gender |
| 9. Lalive d’Epinay, 1985    | Cross-sectional mixed methods | 1978       | Canton, Geneva        | 208 farmers, 65 or older, **102 women** | Wang-SADS          | 44% based on Wang-SADS score of ≥ 4 | Three elements emerged from qualitative interviews:  
1)Too harsh life  
2)Failing health  
3)A bad husband |
| 10. Pulgar et al., 2016     | Cross-sectional | 2011-2012  | North Carolina        | **248** Latina Migrant farmworkers, 18-45, **study of women only** | CES-D               | 31% , based on CES-D score >10 | 1)Unmarried  
2)Lower food security |
| 11. Roblyer et al., 2016    | Cross-sectional | 2011-2012  | North Carolina        | **248** Latina Farmworkers, ages 18-35, **study of women only** | CES-D               | 31% , based on CES-D score ≥ 10 | 1)Family conflict  
2)Perceived racial or ethnic discrimination  
3)Economic insecurity |
<table>
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<tr>
<th>Author(s)/Publication Year</th>
<th>Study design</th>
<th>When</th>
<th>Location</th>
<th>Sample Size</th>
<th>Depression Instrument</th>
<th>Prevalence</th>
<th>Variables identified as associated with depressive symptoms</th>
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<tbody>
<tr>
<td>12. Alderete et al., 1999</td>
<td>Cross-sectional</td>
<td>No date</td>
<td>California</td>
<td>1001 Mexican migrant farm workers, ages 18-59,</td>
<td>CES-D</td>
<td>20%, based on CES-D &gt;16</td>
<td>1) Disrupted marital status 2)Lower age 3)less than high social or instrumental social support 4)High acculturation stress 5)High acculturation stress 6)High discrimination 7)Language conflicts 8)Legal status</td>
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<tr>
<td></td>
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<td>501 women</td>
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</tbody>
</table>
Records identified through database searching (n = 1013)

Records after duplicates removed (n = 858)

Records excluded, with reasons (n = 800)
- Not peer-reviewed
- Discussed consequences of depression
- Discussed specific cause of depressive symptoms

Records screened (n = 858)

Full-text articles assessed for eligibility (n = 58)

Full-text articles excluded, with reasons (n = 45)
- Defined rural women as farm women
- Grouped other psychological conditions with depressive symptoms
- Did not use a validated tool to measure

Studies included in final analysis (n = 13)

Figure 2.1 PRISMA flow diagram (Moher, et al., 2009)
CHAPTER THREE

Predictors of Depressive Symptoms among Farm Women Age 50 and Older
Abstract

**Purpose:** Aspects of farming and farm life can contribute to higher levels of depressive symptoms. Higher levels of depressive symptoms can increase risk for injury, development of chronic disease, and reduced quality of life. Men and women may have different responses to stressors. Farm women can be subjected to stressors from farming as an occupation and their role within the agrarian culture. The purpose of this secondary analysis was to analyze specific variables identified in the review of the literature and their relationship with higher depressive symptoms among farm women aged 50 and older.

**Methods:** This study was a secondary analysis of data from a larger study of farmers ages 50 and over in Kentucky and South Carolina. The sample was comprised of 358 farm women who had participated in the parent study and who had complete data on all the study variables. Depressive symptoms were measured using scores from the CES-D scale. Multivariable binary logistic regression was used to identify variables that predicted high CES-D score (≥ 16) and low CES-D score (< 16) in the cohort. The analysis was framed by the Modified Biopsychosocial Model.

**Findings:** The older farm women’s depressive symptoms status (high vs. low) was predicted by their race/ethnicity, years of education, adequacy of income for vacation, perceived health status, perceived stress level score, and active coping score. Although multiple studies have shown age, marital status, variables related to income, and instrumental support to be associated with depressive symptoms among farm women, there was no significant association between these and depressive symptoms in this study.

**Conclusion:** This study improves our understanding of farm women and supports
previous literature. The study also identified significant gaps related to depressive symptoms of farm women. This secondary analysis revealed the multifaceted dimensions of depression among a cohort of farm women that sets the foundation for future in-depth studies of farm women across the lifespan and interventions that can promote mental wellbeing among this vulnerable population. The approximately 3.5 million farm women whose mental health and quality of life could be affected emphasize the need for more rigorous investigations to provide vital information on farm women in the context of role and culture and their effects on the farm women’s physical and mental health.
Predictors of Depressive Symptoms among Farm Women Age 50 and Older

**Background and Significance**

The agricultural industry is a high stress environment (Burgard & Lin, 2013; Lunner et al., 2013). The unique aspects of farm life and culture can contribute to higher levels of stress and depressive symptoms among farm families. The agricultural industry exhibits higher rates of suicide and highest lifetime risk for major depression compared to other occupations; this is particularly true among production farmers (Burgard & Lin, 2013; Fraser et al., 2005; McIntosh et al., 2016; Roberts & Lee, 1993; Sanne, Mykletun, Moen, Dahl, & Tell, 2004). In addition to higher rates of suicide, higher levels of depressive symptoms can increase an individual’s risk of injury and increase the likelihood of developing chronic disease, all of which can impact overall quality of life (Faragher, Cass, & Cooper, 2005; Trivedi, 2004; World Health Organization (WHO), 2010).

Multiple studies have shown that women are generally at a greater risk of a major depressive disorder than men and have a higher prevalence of depressive symptoms (Angst et al., 2006; Hildebrandt, Stage, & Kragh-Soerensen, 2003; Kessler, 2003; Kim, Cho, Hong, & Bae, 2015; Smith et al., 2008). This suggests men and women may have different responses to stressors and/or different causes of higher depressive symptoms. Farm women can be subjected to stressors associated with farming as an occupation and may be further affected by their identity and role within the agrarian culture, increasing the risk of depressive symptoms (Brandth, 2002; Dimich-Ward et al., 2004; McShane, Quirk, & Swinbourne, 2016; Pryor, Carruth, & Lacour, 2005).
Stressors of farming include environmental, social and physical factors. Studies have shown that farm stressors include: a) uncertainty of economic future, b) burden of physically demanding work, c) long work hours and d) many aspects beyond the farmer’s control, such as governmental regulation, climate, insects, and crop disease (Guiney, 2012; Kearney, Rafferty, Hendricks, Allen, & Tutor-Marcum, 2014; WHO, 2010). Occupational stressors can be further complicated since the farm serves as both the workplace and home, where often, the farmer is working with family members who share the burden of the farm work. This is particularly true on the small family farm where family members often contribute to the farm labor (Fraser et al., 2005; McShane et al., 2016; Swisher, Elder, Lorenz, & Conger, 1998). Farm women may be subjected to further distress where the culture is one of strong work ethic, conservative views, and adherence to gender roles (Brandth, 2002; Herron & Skinner, 2011; Rosenfeld, 1985; Weller, 2017). The patriarchal structure of the farm family dictates that farm women accept major responsibility of the housework, child care, and community activities (Herron & Skinner, 2012; Price & Evans, 2009; Weller, 2017). This may be in addition to unpaid work on the farm and may include an off-farm job (Thurston, Blundell-Gosselin, & Rose, 2003). The burden of multi-tasking can result in physical and mental stress for farm women, further increasing their risk of higher depressive symptoms (Price & Evans, 2009; Thurston et al., 2003).

A review of the literature specific to farm women and depressive symptoms revealed limited studies. In the studies reviewed, many had weak designs, variability in results of prevalence, differences between articles in report of variables associated with depressive symptoms, and differences in age of population sample, making comparison
difficult. The review revealed multidimensional influences from farm women’s social, psychological, biological, environmental, and demographic elements which may increase farm women’s risk for higher depressive symptoms. The leading predictors of higher depressive symptoms included increased family conflict, single marital status, poor health, financial hardship, discrimination, lack of social support, and variables associated with farming as an occupation (i.e., exposure to machinery noise, living on the farm but not actively engaged in farm work, and working on the farm but not getting paid) (Alderete, Vega, Kolody, & Aguilar-Gaxiola, 1999; Booth & Lloyd, 2000; d’Epinay, 1985; Hanklang, Kaewboonchoo, Morioka, & Plernpit, 2016; Hovey & Magana, 2002; Merchant et al., 2002; Pulgar et al., 2016; Rayens & Reed, 2014; Roblyer et al., 2016; Sanne et al., 2004; Stallones & Beseler, 2002; Stallones, Leff, Garrett, Criswell, & Gillan, 1995; Torske, Hilt, Glasscock, Lundqvist, & Krokstad, 2016). There was also evidence that positive job satisfaction from farm work is significantly associated with lower depressive symptoms among farm women (Rayens & Reed, 2014).

Although the work-family environment of the agrarian culture is intertwined, studies of depressive symptoms among farmers have neglected to investigate the effects of farm life and depressive symptoms among farm women. Current research focuses largely on the male farmer. This is despite the increase of female farmers from 5.2% to 13.9% in 2007 and the nearly 3.5 million farm women who may be potentially at risk for higher depressive symptoms (Hoppe & Korb, 2013; Student Action with Farmworkers (SAF), 2011; United States Census Bureau (USCB), 2017; Worldometers, 2018).

The lack of current research, the relationship of chronic depressive symptoms on health and quality of life, as well as gender differences in depressive symptoms noted in
previous research emphasize the need for further investigation of factors affecting farm women and depressive symptoms.

The purpose of this study was to examine aspects from the social, psychological, biological, environmental and demographic elements of farm women to determine the relationships between specific variables identified in the review of the literature and depressive symptoms among farm women aged 50 and older. The overall aim of the analysis was to identify variables that increase the odds of higher depressive symptoms in older farm women, as well as variables that protect farm women from higher depressive symptoms. Identifying risk and protective factors can help focus interventions to reduce depressive symptoms among farm women.

**Modified Biopsychosocial Model**

The Biopsychosocial Model (BPS) (Figure 3.1) was developed originally by George Engel as a medical model to describe the interrelationship of the biological, psychological, and social factors on wellness and disease (Engel, 1977).

The BPS has been applied as a theory in other public health populations. This is particularly true when one or more factors are related to the health behavior such as pain, obesity, smoking, alcohol use and depression (Bruner, Davey, & Waite, 2011; Green & Johnson, 2013; Hildon et al., 2018; Leventhal, 2008; Rosenbaum & White, 2016; Smith et al., 2015). Based on the literature review, the variables associated with higher depressive symptoms among farm women were shown to be multifaceted and without clear boundaries regarding the relationships among the variables and the degree of effect on the outcome variable. Similar to the BPS, variables associated with higher depressive symptoms among farm women were from psychological, social and biological
dimensions; however, the theory was modified to encompass the environmental and specific demographic variables identified from the review of the literature. The Modified Biopsychosocial Theory (MBPS) (Figure 3.2) was applied to predict the multidimensional influences from the farm women’s social, psychological, biological, environmental, and demographic elements which may affect their level of depressive symptoms.

**Methods**

**Design and Sample**

This was a secondary analysis of data from a large cohort study. Data were from the baseline and first follow-up survey of a larger longitudinal study that investigated factors contributing to sustained work by older farmers (Reed et al., 2008). Eligibility for the parent study included: 1) farmer aged 50 or older or spouse of a farmer aged 50 or older enrolled in the study; and 2) ability to speak or read English. The participating institutions’ Institutional Review Boards approved the study prior to data collection. Informed consent was obtained from each participant. Data for the parent study were collected through five panel surveys of the same participants from 2002 through 2006 (Reed et al., 2008).

Variables assessed in the full study included self-reported physical and mental health of the participants as well as farm work indicators. While 988 men and women farmers from Kentucky and South Carolina participated in the initial survey, only women who had complete data on all study variables were in this analysis.
Measures

Items for the original study were developed from questions used in the National Institutes of Safety and Health (NIOSH) sponsored Farm Family Health and Hazard Surveillance Project (FFHHSP) and then used in the Farm Health Interview Survey (FHIS) of the Kentucky Farm Health and Hazard Surveillance Project (Browning, Westneat, Reed, & McKnight, 1999). Additional items from the National Health Interview Survey (NHIS) were used along with other items developed by the investigators of the parent study. Application of the MBSP model separates the influences affecting depressive symptoms of farm women into 5 dimensions: demographic, psychological, biological, environmental, and social. Based on the review of the literature, items selected from the larger study were those related to ethnicity, age, marital status, income adequacy, education, social support, active coping, perceived stress, perceived health, number of farm tasks performed, satisfaction from farm work, and number of hours the woman worked on the farm. Most surveys were conducted by phone; a few were completed in hard copy at the participants’ request.

Demographic

Demographic factors. Assessment of age (in years), race/ethnicity, and education (in years) were obtained by standard survey. The distribution of race and ethnic backgrounds were measured on a nominal scale in the parent study. The composition of the race and ethnic backgrounds indicated a distribution of four categories; 1) White, non-Hispanic, 2) African American, 3) Hispanic/Latino, and 4) American Indian; this variable was recoded to a binary variable of “White, non-Hispanic” and “non-White” with African American, American Indian, and Hispanic/Latino coded as 1 and White,
non-Hispanic as the reference category. Participants were asked four questions related to income adequacy. “How adequate was your household’s income to: a) meet household living expenses, b) pay for vacations and leisure activities, c) make major household purchases, and d) allow you to save for retirement?” with scaled response of “always”, “usually”, “usually not” adequate. These were also recoded to a binary variable of “always” and “usually adequate” as the reference group.

Psychological

Depressive behavior symptoms. The Center for Epidemiologic Studies-Depressive Symptoms Scale (CES-D) (Radloff, 1977) was used to measure depressive symptoms. The CES-D has been tested and utilized across different ages and ethnic backgrounds and has been shown to have good sensitivity and specificity and high internal consistency (Frerichs, Aneshensel, & Clark, 1981; Hovey, 2000; Lewinsohn, Seeley, Roberts, & Allen, 1997; Radloff, 1977). Respondents report the frequency of symptoms during the previous week on 16 negatively worded questions (e.g., “I felt fearful”) and four positive items (e.g., “I felt hopeful about the future”) of the 20-item scale. Possible response options include: a) less than 1 day, b) 1-2 days, c) 3-4 days and d) 5-7 days. The items are totaled for a final score after reversing the ratings of the four positively worded questions. Cronbach’s alpha for this sample was 0.88. The optimal cut off for mild to moderate depression is 16-21 and scores over 21 are considered as a possibility of major depression (Counselling Resource, 2018). For the present study, scores were divided into two groups utilizing the optimal cut-off value of 16 to indicate categories of depressive symptoms, with lower depressive symptoms (0-15) and higher depressive symptoms (≥16).
**Active coping.** The 12-item John Henry Active Coping Scale (JHAC-12) was used to measure active coping. The JHAC-12 was developed by Sherman James based on the “John Henryism” effect. John Henryism is the hypothesis proposed by James, Hartnett, and Kalsbeek (1983) suggesting that those who face stressors (i.e., low socioeconomic resources, job insecurity, uncertainty of future) for extended periods of time continue to persist in their day-to-day lives despite their situation. The JHAC-12’s three major concepts are comparative to the agrarian culture: 1) mental and physical vigor, 2) a strong commitment to hard work, and 3) a single-minded determination to succeed (James, 1994). The tool has been previously used in a study of African American farmers (n=156) with a Cronbach’s alpha of .81 (Maciuba, Westneat, & Reed, 2013). Responses are scored from 1 (completely false) to 5 (completely true). Examples of questions include: a) “I’ve always felt I could make of my life pretty much what I wanted to make of it;” and “It’s not always easy, but I manage to find a way to do the things I really need to get done.” (James, 1994). Scores can range from 12 to 48. The higher the score, the higher the John Henryism, indicating a stronger coping propensity despite undesirable circumstances (James et al., 1983; Wiist & Flack, 1992). Cronbach’s alpha for this study was 0.80.

**Perceived stress.** Perceived stress was measured by an abbreviated 5-item version of the 14-item Perceived Stress Scale (PSS) (Cohen, Kamarck, & Mermelstein, 1983). The questions selected in the original study were those felt to be more closely related to stress within the farm culture and (Rayens & Reed, 2014). Participants were asked to respond to five questions regarding the frequency of thoughts and feelings over the last month with the possible answers of “never” (1), “almost never” (2), “some time”
(3), “fairly often” (4), and “very often” (5). Examples of the items included were: “felt stressed and nervous;” “felt that things were going your way;” “felt difficulties were piling up so high you could not overcome them;” “been able to control irritations in your life;” and “been able to control the way you spend your time.” The three positive items in this version were reversed coded so that a higher score indicated a greater perceived stress level. The range of possible scores was from 5 to 25, with greater values for the total score indicating higher overall stress. Cronbach’s alpha for this shortened PSS with this sample was 0.75.

**Biological**

**Perception of health.** This was measured in a single item from the National Health Interview Survey: “How would you rate your health in general? Would you say it is: a) excellent, b) very good, c) good, d) fair, or e) poor.” Items were coded so that 0= poor, 1= fair, 2= good, 3= very good, and 4= excellent, to rank the scores from a reflection of lack of the characteristic to the extreme of excellent health. This self-rated health was then recoded as “Fair” or better versus “Poor”, since these descriptors best delineate the division between better and worse perception of health.

**Environmental**

**Farm tasks.** Participants were asked to check “yes” or “no” from a list of 23 farm-related tasks performed over the previous year. Items reflected a broad range of tasks pertaining to crop production and animal care, as well as tasks related to managing the farm. Sample items from this list included “mowed fields,” “herded animals,” and “ordered farm supplies.” The total score was the number of “yes” items.
Weekly hours worked. A numerical value was placed in the blank regarding the question “How many hours did you spend doing farm work last week?” Considering that the standard deviation (12) was larger than the mean (8), emphasizing the right skew of this variable (with many participants working very few hours and relatively few working a much greater number), this was then coded as a binary variable to reflect those women who did not work any hours on the farm in the past week versus those who spent at least 1 hour on farm work.

Satisfaction from farm work. Participants were asked, “Overall, how much personal satisfaction do you get from your farm work?” Response options included: a) “a great deal of satisfaction”, b) “some satisfaction”, c) “very little satisfaction”, and d) “no satisfaction”. Given that 87% of the participants in this study chose either the first or second option, this variable was recoded as a binary indicator, with one category comprising those with little to no satisfaction and the other with those with at least some satisfaction.

Social

Instrumental support. Participants were asked to answer either “yes” or “no” regarding the availability of someone to assist with the farm work during an emergency.

Data Analysis

Descriptive analysis, including means and standard deviations or frequency distributions summarized study variables. Bivariate analysis was used to compare women with lower CES-D scores (<16) to those women who had higher CES-D scores (≥16), including the two-sample t-test or chi-square test of association as appropriate.

Multivariable binary logistic regression was used to test whether specific demographics,
psychological, biological, social or farm-related environmental factors were associated with higher depression scores among older farm women. Variance inflation factors were used to assess the presence of multicollinearity and the Hosmer-Lemeshow evaluated model fit. Analysis was performed using IBM SPSS, v.22; an alpha level of .05 was used (IBM Corp., 2013).

Results

There were 358 participants with an average age of 63.7 years (SD=7.6; Table 3.1). The sample was 83% White, non-Hispanic and 92.5% were married. The average education level was 12.5 years (SD=2.8). Most of the women reported their income as adequate for living expenses (82.7%) and major household purchases (87.7%), but fewer reported an income adequate for vacation (69%) and even fewer reported income adequate to save for retirement (59.8%). A large percentage of participants reported their overall health as fair to excellent (95%; Table 3.2). The majority of women (85%) scored < 16 on the CES-D, with the remaining 14 % scoring ≥ 16. Overall perceived stress scores were low. The mean perceived stress score of all participants was 10.7 (SD=3.7, range 5-24). Scores of active coping were overall high with a mean of 40.8 (SD=4.4) on the JHAC-12 scale of 12-48.

The majority of women had someone to assist with the farm work during an emergency (77.4%). A little over half of the farm women (58.7%) worked on the farm during the previous week and reported a wide variety of weekly hours worked on the farm. The participants reported a range from 0 to 90 hours per week on the farm during the previous week with a mean of 7.4 (SD=12.1). The number of farm tasks over the past year ranged from 0-20, with a mean number of tasks performed over the past year of 4.9
(SD=4.4). Overall, the women were satisfied with farm work with 87.2% reporting positively.

For group comparisons, there were several variables between those with low CES-D levels and those with high CES-D levels that demonstrated a significant group effect. Race/ethnicity, years of education, adequate income for vacation and retirement, reported health status of fair or better, perceived stress score, active coping score and satisfaction from farm work were all significant between groups (see Table 3.1 and Table 3.2). A Chi-square test for independence (with Yates Continuity Correction) indicated a significant association between race/ethnicity and high CES-D score ($\chi^2 (1) = 6.074. p < .001$). There was twice the percentage of non-White Americans in the high CES-D group, 24% versus 12%. Level of education was significantly different between groups (p = .003), with a slightly lower level of education among those in the high CES-D group (mean difference 1.26, 95% CI: .44 to 2.081) and very small effect size (eta squared=.003; p=.003, Table 3.1). Of those participants in the high CES-D group, only 8.5% reported income adequate for vacation and 9.8% adequate for retirement, compared to 91.5% and 90.2%, respectively of those with low CES-D scores (p=.001; p=.003). Small effect size was noted in both income adequate for vacation and retirement.

Those with higher perceived stress scores were more likely to be in the high CES-D group (Table 3.2). Significance was noted between groups (p= < .001) and effect size small (mean difference= -5.41, 95% CI: -6.35 to -4.46, eta squared= .003). The coping level among the farm women was overall very high (40.8, SD=4.4) and while the difference between the groups was significant, the variance between groups was small (mean difference 1.45, 95% CI: .15 to 2.75, eta squared p=.003). The participants were
mostly satisfied with their farm work (87.2%), but significance was noted between groups $\chi^2 (1, n=358) = 5.0, \phi = -0.013)$. The farm women in this study were less likely to be in the high CES-D group if they had higher levels of coping scores or were satisfied with farm work.

**Predictors of depressive symptoms**

Logistic regression was performed to assess the impact of a number of factors and the likelihood of the participant having high CES-D score. The full model contained 15 independent variables. The logistic regression modeling high depressive symptom score was significant overall ($\chi^2 = 142.93, p< .001$), indicating that the model was able to distinguish between those farm women who had low CES-D scores and those who had high scores. The model as a whole explained between 33% (Cox and Snell R square) and 59% (Nagelkerke R squared) of the variance in CES-D score, and correctly classified 91.1% of cases.

As shown in Table 3.3, six of the independent variables made a unique statistically significant contribution to the model (race/ethnicity, years of education, income adequacy for vacation, reported health of fair or better, perceived stress score and active coping score). A participant was less likely to have high depressive symptoms as measured by the CES-D if she was White, non-Hispanic and had high levels of education (-1.25, $p=0.016$; -.18, $p=0.045$; respectively). Women who reported income adequate for vacation were less likely to have high CES-D scores (-1.87, $p<0.001$). Those respondents who reported health of “fair” or better were less likely to have high CES-D scores when controlling for all other factors in the model (-2.35, $p=0.003$). Although active coping score was high overall, significance between the groups was noted: those with
higher coping scores were less likely to have high CES-D scores (-.11, p= .021). The strongest predictor of high CES-D score was perceived stress level, with odds of 1.81 (p=<.001), indicating that farm women who have higher perceived stress were almost twice as likely to have high CES-D score, when controlling for all other factors in the model.

Discussion

In this study of 358 farm women, there were several factors that significantly predicted score of 16 or above on the CES-D. Consistent with the literature review and the MBPS model, factors were identified from specific demographics, biological and psychological dimensions. No significant factors from either the social or environmental dimensions were noted in this study. This is likely due to having a limited amount of questions available from the parent study addressing these areas. Comparable to the literature review, race/ethnicity, levels of education, factors associated with financial adequacy, health rating, perceived stress scores, and active coping scores were significant predictors of high depressive symptoms among farm women (Alderete et al., 1999; Booth & Lloyd, 2000; d'Epinay, 1985; Hovey & Magana, 2002; Rayens & Reed, 2014; Roblyer et al., 2016; Stallones & Beseler, 2002; Stallones et al., 1995; Torske et al., 2016).

However, there are several indicators that the overall mental health of farm women is healthy. This suggests the need for further investigation regarding aspects of farm life which may enhance overall mental wellness and protect farm women from higher depressive symptoms.

In this study, race/ethnicity significantly predicted higher depressive symptoms, with twice as many non-White Americans as White, non-Hispanic in the group with high
depressive symptoms. Women with high depressive symptoms also had a slightly lower level of education. Results are consistent with those of other studies (Alderete et al., 1999; Hanklang et al., 2016, Hovey & Magana, 2002; Roblyer et al., 2016). Specific demographics (race/ethnicity, education, socioeconomic groups) are commonly noted as predictors of depressive symptoms among women and minorities of the general public not necessarily living on farms (Becares, Laia, & Jackson, 2014; Marshall, Hooyman, Hill, & Rue, 2013).

The sample population from our study was largely White, non-Hispanic (82.7%) but had 17.3% non-White participants, which is a rather large minority subset in farm-based studies. The approximate 500,000 migrant farm women (SAF, 2011) in the U.S. poses questions regarding specific demographics, lack of U.S. citizenship, and their relationship to depressive symptoms among the subset of migrant farm women; these questions should be further investigated. More studies should be conducted with both African Americans and migrant farm women to investigate the relationship between demographic variables and depressive symptoms among farm women.

Application of the MBPS model includes additional specific demographics associated with depressive symptoms in farm women. Financial adequacy is commonly noted as a variable associated with depressive symptoms; the literature review supports this association among farm women (Roblyer et al, 2016; Sanne et al., 2004; Stallones and Beseler, 2002). Questions of income adequacy focused on living expenses, retirement, major purchases, and vacation. Although income adequacy for vacation and retirement between groups was significant, only income adequacy for vacation was a significant predictor of high depressive symptoms among older farm women. This further
supports Chikani, Reding, Gunderson, and McCarty’s (2005) study of 1500 rural women, confirming their hypothesis that women who take vacations are less likely to become depressed. The psychological and physical benefits of a vacation are well documented; however, studies of farm women regarding this subject are limited (Caldwell & Smith, 1988; de Bloom et al., 2009; Gump & Matthews, 2000). Despite trends of increasing leisure time among many occupations and increasing emphasis of work-life balance, farming is a demanding occupation with little attention to intentional leisure (Bolwerk, 2002; Buettner, Shattell, & Reber, 2011; Smit, 2016). Leisure time for farm women could be problematic as the agrarian culture is one in which many farmers believe leisure time is possible only after all the work is done (Bolwerk, 2002). The study used in our analysis did not specify other factors related to the benefits of a vacation or barriers other than financial inadequacy; but even this limited inquiry predicted higher depressive symptoms in the sample. The subject of leisure time and vacation among farm women is large a gap in the exploration of specific demographics and social factors in the research with farm populations.

Having poor health, higher levels of perceived stress score and lower levels of active coping score significantly predicted higher levels of depressive symptoms. While these variables have been commonly found to be associated with higher depressive symptoms among farm women within the biological and psychological dimensions of the MBPS (Booth & Lloyd, 2000; Hovey & Magana, 2002; Rayens & Reed, 2014; Stallones & Beseler, 2002; Stallones et al., 1995), the farm women analyzed here reported overall high levels of active coping, lower levels of perceived stress and fair to better health. Additionally, the majority (87.2%) were largely satisfied with farm work, and 85.8% had
CES-D scores below 16, the standard cutoff for indication of depression. This suggests that farm women are generally mentally and physically healthy and psychologically secure in their work. This may be a result of “positive affect” effect.

The characteristics of “positive affect” effect include confidence, self-efficacy, physical well-being, effective coping, flexibility, optimism, and pro-social behavior. “Positive affect” is a result of frequent positive moods and possession of skills and resources developed over time resulting in higher adaptive characteristics (Lyubomirsky, King, & Diener, 2005). Reed and Rayens (2014), in their study of 674 older rural couples and predictors of depressive symptoms, suggested a similar term of “healthy worker” effect. Their results reported an overall lower depressive symptom score of the sample population. The authors suggest that the “healthy worker effect” on the results may be related to many participants in their study who were relatively healthy and actively engaged in farm work, resulting in a more favorable depression rate. The results here are more suggestive of the positive affect effect. While higher numbers of those with lower depressive symptoms reported working on the farm, there is only a slight difference between groups regarding the mean and standard deviation of number of farm tasks over the previous year \((Mean = 5.2, SD= 4.5; Mean = 4.8 SD= 4.1, \text{ respectively})\). However, the majority of women with low CES-D did report satisfaction from farm work. Results may have been different had those women who did no farm tasks over the past year had been excluded. The favorable levels noted in this study prompt further questions and thought.

The MBPS model should be applied in future research with farm women to more fully explore the interrelationship among variables and physical and mental outcomes. The results indicate a need for more robust investigation of farm women’s activities and
work level, health indicators, quality of life, adaptability, social behavior, and perceived health, for a better understanding of those variables on depressive symptoms and other outcomes in farm women.

Several variables identified from the literature review were shown to be associated with farm women and high depressive symptoms that were not a focus of the original study. The majority of factors were those associated with migrant farm women and a large number of social factors (Alderete et al., 1999; Booth & Lloyd, 2000; d’Epinay, 1985; Hanklang et al., 2016; Hovey & Magana, 2002; Merchant et al., 2002; Pulgar et al., 2016; Roblyer et al., 2016; Sanne et al., 2004; Stallones & Beseler, 2002). In applying the MBPS theory, which includes variables from environmental and social aspects, could have provided a more comprehensive insight to the knowledge of depressive symptoms among older farm women but will provide a basis for opportunities for further investigation.

This study has several limitations. This is a secondary analysis of a dataset not primarily focused on depressive symptoms. The data was collected by cross-sectional design, reflecting only one moment in time in an occupational culture that is highly seasonal. Variables that are more fluid such as active coping, perceived health, perceived stress, and potentially income, may not be reflective of their effects on depressive symptoms of the farm women over longer periods of time or at times of increased work load. The majority of women in this study were over the age of 50 and married, which may limit generalizability of results among all farm women. The parent study population was purposively sampled from two different geographical areas (North Carolina and Kentucky) and composed largely of White, non-Hispanic farm couples who may
experience different stressors secondary to the type of farming or differences in culture, making generalizability limited.

**Conclusion**

Considering the large number of farm women, the increasing number of female farmers, and the changing role of farm women, it is imperative that knowledge be increased about this population, particularly as it relates to the mental health of farm women and their overall quality of life. This study adds to the knowledge of science but has also identified significant gaps related to depressive symptoms and farm women. This secondary analysis revealed the multifaceted dimensions of depression among a cohort of farm women that sets the foundation for future in-depth studies of farm women across the lifespan and interventions that can promote mental wellbeing among this vulnerable population.
Table 3.1 Demographic characteristics of the total sample of participants, with comparisons by low versus high CES-D grouping using the two-sample t-test or chi-square test of association (N=358)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Total sample (N=358)</th>
<th>By CES-D level group</th>
<th>p-value for group comparison*</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean (SD) or n (%)</td>
<td>Mean (SD) or n (%)</td>
<td></td>
</tr>
<tr>
<td><strong>Demographic</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age (years)</td>
<td>63.7 (7.6)</td>
<td>63.6 (7.4)</td>
<td>64.1 (8.5)</td>
</tr>
<tr>
<td>Race/Ethnicity</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>White/non-Hispanic</td>
<td>296 (82.7%)</td>
<td>260 (87.8%)</td>
<td>36 (12.2%)</td>
</tr>
<tr>
<td>Marital status (married)</td>
<td>331 (92.5%)</td>
<td>284 (85.8%)</td>
<td>47 (14.2%)</td>
</tr>
<tr>
<td>Education (years)</td>
<td>12.5 (2.8)</td>
<td>12.7 (2.7)</td>
<td>11.6 (3.0)</td>
</tr>
<tr>
<td>Income adequate for living expenses</td>
<td>321 (89.7%)</td>
<td>276 (86.0%)</td>
<td>45 (14.0%)</td>
</tr>
<tr>
<td>Income adequate for saving for major household purchases</td>
<td>314 (87.7%)</td>
<td>273 (86.9%)</td>
<td>41 (13.1%)</td>
</tr>
<tr>
<td>Income adequate for vacation</td>
<td>248 (69.3%)</td>
<td>226 (91.5%)</td>
<td>21 (8.5%)</td>
</tr>
<tr>
<td>Income adequate for retirement</td>
<td>214 (59.8%)</td>
<td>193 (90.2%)</td>
<td>21 (9.8%)</td>
</tr>
</tbody>
</table>

*p-value for t-tests; all other p-value reported are for chi-square test of association
Table 3.2  The Modified Biopsychosocial characteristics of the total sample of participants, with comparisons by low versus high CES-D grouping using the two-sample t-test or chi square test of association (N=358)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Total sample (N=358)</th>
<th>By CES-D level group</th>
<th>p-value for group comparison*</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Observed % of total population</td>
<td>Observed % of those with low (&lt;16) CES-D (n=307)</td>
<td>Observed % of those with high (≥16) CES-D (n=51)</td>
</tr>
<tr>
<td></td>
<td>N (%)</td>
<td>n (%)</td>
<td>n (%)</td>
</tr>
<tr>
<td>Biological</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Self-reported health rating of good or better</td>
<td>340 (95.0%)</td>
<td>299 (87.9%)</td>
<td>41 (12.1%)</td>
</tr>
<tr>
<td>Psychological</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Perceived stress level</td>
<td>10.7 (3.7)</td>
<td>9.9 (3.2)</td>
<td>15.3 (2.8)</td>
</tr>
<tr>
<td>Active coping level</td>
<td>40.8 (4.4)</td>
<td>41 (4.3)</td>
<td>39.6 (4.7)</td>
</tr>
<tr>
<td>Social</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Instrumental support</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Has assistance with farm work during emergency</td>
<td>277 (77.4%)</td>
<td>239 (86.3%)</td>
<td>38 (13.7%)</td>
</tr>
<tr>
<td>Environmental</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Works on farm</td>
<td>210 (58.7%)</td>
<td>185 (88.1%)</td>
<td>25 (11.5%)</td>
</tr>
<tr>
<td>Number of farm tasks over previous year</td>
<td>5.7 (4.5)</td>
<td>5.2 (4.5)</td>
<td>4.8 (4.1)</td>
</tr>
<tr>
<td>Satisfaction from farm work</td>
<td>312 (87.2%)</td>
<td>273 (87.5%)</td>
<td>39 (12.5%)</td>
</tr>
</tbody>
</table>

*p-value for t-tests; all other p-value reported are for chi-square test of association
Table 3.3  Logistic regression to assess predictors of the binary CES-D indicator  
(N=358)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Parameter estimate</th>
<th>Odds ratio (p-value)</th>
<th>95% confidence interval for odds ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Demographic</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td>.00</td>
<td>1.0 (.99)</td>
<td>0.94-1.06</td>
</tr>
<tr>
<td>White, non-Hispanic</td>
<td>-1.249</td>
<td>0.29 (.016)</td>
<td>0.10-0.79</td>
</tr>
<tr>
<td>Hosmer-Years of education</td>
<td>-.176</td>
<td>0.84 (.045)</td>
<td>0.71-1.0</td>
</tr>
<tr>
<td>Married</td>
<td>.296</td>
<td>1.34 (.72)</td>
<td>0.27-6.59</td>
</tr>
<tr>
<td>Income adequate for living expenses</td>
<td>1.525</td>
<td>4.60 (.079)</td>
<td>0.84-25.26</td>
</tr>
<tr>
<td>Income adequate for major household purchases</td>
<td>-.231</td>
<td>0.79 (.75)</td>
<td>0.19-3.35</td>
</tr>
<tr>
<td>Income adequate for vacation</td>
<td>-1.868</td>
<td>0.15 (&lt;.001)</td>
<td>0.054-0.44</td>
</tr>
<tr>
<td>Income adequate for retirement</td>
<td>.705</td>
<td>2.02 (.16)</td>
<td>0.76-5.38</td>
</tr>
<tr>
<td><strong>Biological</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Self-reported health level of fair or better</td>
<td>-2.346</td>
<td>0.96 (.003)</td>
<td>0.02-0.45</td>
</tr>
<tr>
<td><strong>Psychological</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Perceived stress score</td>
<td>.592</td>
<td>1.81 (&lt;.001)</td>
<td>1.51-2.16</td>
</tr>
<tr>
<td>Active coping score</td>
<td>-.114</td>
<td>0.89 (.021)</td>
<td>0.81-0.98</td>
</tr>
</tbody>
</table>
Table 3.3 Continued

<table>
<thead>
<tr>
<th>Variable</th>
<th>Parameter estimate</th>
<th>Odds ratio (p-value)</th>
<th>95% confidence interval for odds ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Demographic</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Social</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Has access to assistance with farm work in an emergency</td>
<td>.230</td>
<td>1.26 (.69)</td>
<td>0.42-3.81</td>
</tr>
<tr>
<td><strong>Environmental</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Worked on the farm in the past week</td>
<td>-.510</td>
<td>0.60 (.31)</td>
<td>0.23-1.60</td>
</tr>
<tr>
<td>Number of farm tasks over previous year</td>
<td>.045</td>
<td>1.05 (.42)</td>
<td>0.94-1.17</td>
</tr>
<tr>
<td>Receives satisfaction from farm work</td>
<td>-.513</td>
<td>0.60 (.41)</td>
<td>0.18-2.01</td>
</tr>
</tbody>
</table>
Figure 3.1 The Biopsychosocial Model of Health (Social Work Exam Review, 2014)
Figure 3.2 MBPS Conceptual Model in Relation to Farm Women and Depressive Symptoms
CHAPTER FOUR

Reliability and Validity of the John Henry Active Coping Scale in a Sample of Farm

Women Aged 50 and Over
Abstract

Background: Psychosocial constructs are influenced by culture, genetic make-up and life experiences, therefore, measuring behaviors is highly subjective. Gaps in the knowledge about psychosocial constructs as they apply to the approximate 3.5 million farm women in the U.S. have also revealed the lack of tested tools within this population. Recent concerns regarding depressive symptoms among farmers have resulted in a need to assess factors associated with depressive symptoms, such as active coping.

Objective: The objective of this analysis was to assess the reliability and validity of the 12-item John Henry Active Coping Scale (JHAC-12) among a sample of older farm women.

Method: The sample consisted of 485 women aged 50 and older (407 White, non-Hispanic and 78 non-White farm women) who completed the JHAC-12 in a cohort study of farm couples (n= 1044) in Kentucky and North Carolina. Internal consistency reliability was examined using Cronbach’s alpha. Principal Component Analysis (PCA) with oblimin rotation was used to investigate scale dimensionality and assess validity.

Findings: Although we tested a forced 3-component solution, a 2-component simple structure (high loadings within components and no major cross-loadings between components) provided a better fit. Item reduction resulted in the removal of 2 items from the scale. The JHAC-10 refined the scale by increasing the explained variance by 4.1% to a total of 44.6% with fewer items. Eight items loaded .4 or greater onto Component 1 (“commitment to hard work”), and two items loaded strongly onto Component 2 (“self-efficacy”) with values > .7. Weak correlation was noted between the two components (r= .29). Reliability was acceptable for a modified 10-item scale (JHAC-10) (Cronbach α =
.76) and the JHAC-12 (Cronbach’s $\alpha = .78$). Evidence supports both convergent and discriminant validity of the JHAC-10 and JHAC-12.

**Conclusion:** Few agricultural health studies use standardized or tested instruments, making it difficult to amass a sound body of knowledge. Evidence supports reliability and validity of both the JHAC-10 and JHAC-12 among a sample of older farm women. Use of the JHAC-10 would also decrease participant burden. The final two components (“commitment to hard work” and “self-efficacy”) are comparable to the agrarian culture suggesting the JHAC reflects the sociocultural aspects of active coping in the population of farm women. Future studies may incorporate the JHAC-10 or JHAC-12 to provide comparable data across research on the coping styles of farm populations.
Reliability and Validity of the John Henry Active Coping Scale in a Sample of Farm Women Aged 50 and Over

**Background**

Measuring psychosocial constructs for use in scientific research can be problematic due to the high level of subjectivity and factors influencing the behaviors and attitudes of a population. Accurate measure of psychosocial constructs is important for the researcher to provide greater precision in testing hypotheses, resulting in greater veracity in their results.

The factors affecting behaviors and attitudes are largely influenced by genetic make-up, social norms, religious beliefs, culture, and life experiences (Busjahn, Faulhaber, Freier, & Luft, 1999; Carver, Weintraub, & Scheier, 1989; Flaskerud & Delilly, 2012; James, 1994; Markstrom, Marshall, & Tryon, 2000; Matud, 2004). It is therefore unrealistic to expect to accurately measure psychosocial constructs with the same tool across different population samples. Evidence supporting a tool’s reliability and validity for use with various populations provides rigor to the researcher’s work.

Findings from numerous studies of depressive symptoms in adults suggest that there is a relationship between an individual’s response and adaptation to stress and depressive symptoms (Campbell-Sims, Cohan, & Stein, 2006; Garnefski, Legerstee, Kraaij, Van Den Kommer, & Teerds, 2002; Lazarus, 1990; Sale, Gignac, & Hawker, 2008). This response and adaptation to stress is referred to as “coping.” As defined by Lazarus (1990), coping refers to “constantly changing cognitive and behavioral efforts to manage specific external and/or internal demands that are appraised as taxing or exceeding the resources of the person” (p.99).
The Semel Institute for Neuroscience and Human Behavior (SINHB) (2019) denotes two types of coping styles, instrumental and emotion-focused, with the two categories further distinguished as either active or avoidant. Instrumental coping, often referred to as problem solving, is when the individual assesses ways to correct the issue at hand in order to reduce the stress associated with it. The emotion-focused coping style assists the individual to be less emotionally reactive or alters the experience to reduce the negative impact. Active coping involves an awareness of the stressful situation accompanied by attempts to reduce or eliminate the stressor. Conversely, avoidant coping is demonstrated by ignoring or denying the issue or problem.

Exploration of the effects of social factors such as social support, discrimination, and socioeconomic status on stress and coping has evoked the need for an instrument to accurately incorporate these constructs. Measures of active coping have frequently been used in studies in which investigators were interested in examining associations between depressive symptoms and coping within specific sociocultural contexts (James, Hartnett, & Kalsbeek, 1983; Kim, Han, Shaw, McTavish, & Gustafson, 2010; Roohafza et al., 2014). One such commonly used measure was developed by Sherman James (James et al., 1983). In his efforts to better understand factors that influence health disparities in African American populations, James developed the 12-item John Henry Active Coping Scale (JHAC-12) (James et al., 1983).

The JHAC-12 is based on a hypothesis James called John Henryism. This hypothesis suggests that considerable effort is required to cope with life stressors among persons who face stressors such as limited socioeconomic resources, job insecurity, low educational levels, and uncertainty regarding their future for extended periods of time.
The extended time spent surviving may have detrimental effects on their health. James’ hypothesis was supported by the outcomes of a study he conducted with African American men that indicated stress and coping styles were associated with hypertension (James, 1994). The higher the score on the JHAC-12, the higher the John Henryism, indicating a stronger coping propensity despite undesirable circumstance. The results of other studies have also shown a positive association between higher JHAC-12 scores and health and life satisfaction (Bonham, Sellers, & Neighbors, 2004; James, Strogatz, Wing, & Ramsey, 1987, James et al., 1983; Wiist & Flack, 1992). This has been further supported in studies suggesting that in addition to social factors, intrapersonal factors such as positive attitude can influence coping (Aspinwall & Taylor, 1992; Carver et al., 1989; Fernander, Duran, Saab, Llabre, & Schneiderman, 2003). John Henryism has since been accepted and formally recognized as a style of coping that can be measured using the JHAC-12 (Duke Medicine News & Communication, 2006).

The JHAC-12’s three major themes are: 1) mental and physical vigor, 2) a strong commitment to hard work, and 3) a single-minded determination to succeed (James, 1994). Although originally developed in response to addressing sociocultural aspects of African Americans’ coping and its effect on their health, the JHAC-12 has been used in various ethnic and racial populations, among men and women, in rural and urban settings, and in a variety of socioeconomic levels (Bennett et al., 2004; Fernander et al., 2003, Fernander et al., 2005; Haritatos, Mahalingham, & James, 2007; James, 1994; Li, 2008; Logan, Barksdale, & James, 2017; Maciuba, Westneat, & Reed, 2013; Markovic, Bunker, Ukoli, & Kuller, 1998; Reed et al., 2008; Watson, Logan, & Tomar, 2008.) Despite its
wide use in various populations and settings, few studies have been conducted to test the construct validity of the JHAC-12 within a sample of older farm women.

An extensive literature search of reputable sources, including Google Scholar, Cumulative Index to Nursing and Allied Health (CINAHL), and PubMed using the terms psychometric, assessment, reliability and validity and self-efficacy with John Henry Active Coping Scale produced two articles with purposeful psychometric testing of the JHAC-12. Fernander et al. (2003) performed psychometric testing of the JHAC-12 among a sample of middle-aged, urban residents with both African American (n=75) and White Americans (n=129), reporting evidence of both convergent and discriminant validity of the JHAC-12 among both groups. Internal consistency reliability among the two groups was also confirmed by Fernander et al. (2003) and shown to be consistent with previous studies with Cronbach’s alpha of 0.65 (African American) and 0.64 (White Americans). The author concluded the scale had two dominant themes: “commitment to succeed through hard work” and “personal efficacy” (Fernander et al., 2003, p. 156). Weinrich, Weinrich, Keil, Gazes, and Potter (1988) also demonstrated the support of two constructs, hard work and tenacity, within a sample of both African American and White men (n=1017) aged 17-60. Though not a study focused on factor analysis, findings from Reed et al. (2008) supported the validity and reliability of the JHAC-12 when used in a sample of 1,044 older male and female farmers. This was further supported in the Maciuba et al. (2013) sample of 156 African American older farmers, as factor analysis confirmed construct validity of the JHAC-12 in the population sample. Neither Reed et al. (2008) nor Maciuba et al. (2013) stated a specific number of components.
Attempts to address increasing rates of suicide and higher rates of depressive symptoms among the agricultural community have highlighted an increased need to investigate factors such as active coping associated with depressive symptoms among farmers (Bolin et al., 2015; Burgard & Lin, 2013; Gallagher, Kliem, Beautrais, & Stallones, 2007). Despite the nearly 3.5 million farm women in the U.S., the majority of current research on depression has focused on farm men (Student Action with Farmworkers (SAF), 2011; United States Census Bureau (USCB), 2017; Worldometers, 2018).

The unique aspects of the agrarian culture, the gendered role of farm women within the culture, and the occupation of farming may contribute to higher levels of stress and depressive symptoms; hence the need to utilize tested tools during research with farm women that encompass the sociocultural aspects of their lives and work. The JHAC-12’s three major concepts are comparative to the agrarian culture, placing a value on individual determination where despite significant hardship, individuals can master their own environment if they are determined to do so (Flaskerud & Delilly, 2012; James, 1994; Logsdon, 1994; Peck, Grant, McArthur, & Godden, 2002; Swisher, Elder, Lorenz, & Conger, 1998). Although widely used and tested among a variety of populations, including a sample of mixed gender older farmers and older African American farm men, the JHAC-12 has not been evaluated for use in a sample of older farm women. The purpose of this study is to establish reliability and validity of the JHAC-12 in a sample of older farm women.
Methods

Participants

This study is based on a subset of a larger mixed methods cohort study of older farmers in Kentucky and South Carolina that examined their work, health and sociocultural constructs of sustained work (Reed et al., 2008). Data for the parent study were collected through five panel surveys of the same participants from 2002 through 2006. Eligibility criteria for the parent study included: 1) farmer aged 50 or older, or spouse of a farmer aged 50 or older; and 2) ability to speak and read English. Institutional Review Boards of the University of Kentucky and the University of South Carolina approved the study prior to data collection. Informed consent was obtained from each participant.

For the purpose of these analyses, cross-sectional data from the parent study second survey were used. While the survey included 1044 male and female farmers from Kentucky and South Carolina, only women who had complete data on the JHAC-12 were retained for this secondary analysis of data (N=485).

Measures

Demographic data on age (in years), race/ethnicity, marital status, education (in years) and adequacy of income for living expenses were analyzed to describe the sample. The distribution of race and ethnic backgrounds, measured on a nominal scale in the parent study, indicated that most non-White participants were African American, so this variable was recoded to a binary variable of “White, non-Hispanic” and “Non-White,” with African Americans, American Indian, Hispanic and other race coded non-White.

The JHAC-12 consists of 12 items with four-point Likert scale response options. The items are reported to measure the three main concepts of John Henryism; (1)
“efficacious mental and physical vigor; (2), a commitment to hard work; and (3), a single-minded determination to achieve one’s goals” (James, 1994; Weinrich et al., 1988, p. 166). Responses were scored from 1 (completely false) to 5 (completely true). Examples of questions include: “I’ve always felt I could make of my life pretty much what I wanted to make of it,” and, “It’s not always easy, but I manage to find a way to do the things I really need to get done.” (James, 1994). Scores range from 12 to 48. Higher scores indicate tenacity, strong sense of self efficacy, and mental and physical stamina when confronting environmental stressors (Fernander et al., 2003; James, 1994).

Data Analysis

A descriptive analysis, including means and standard deviations or frequency distributions were used to summarize the sample characteristics. Internal consistency reliability of the JHAC-12 was assessed using Cronbach’s alpha. Principal Components Analysis (PCA) with oblimin rotation was used to assess the dimensionality of the items in the JHAC-12 as well as both convergent and discriminant validity. Prior to performing PCA, assumptions of linearity and presence of outliers were assessed. Sampling adequacy was examined using the Kaiser-Meyer-Olkin (KMO) measure and Bartlett’s Test of Sphericity (Bartlett, 1954) to determine the suitability of the data for factor analysis. All data analysis was done using SPSS version 25 (IBM, 2017).

Results

Sample Characteristics

The average age of all 485 participants was 64 years (SD=7.6) with a range of 50 to 88. The sample was 84% White, non-Hispanic and 16% non-White; 92% of the total sample were married. The majority (89%) of women reported adequacy of income
sufficient for living expenses; however, this percentage dropped when comparing ethnic
groups, as 78% of the non-White participants reported adequacy of income sufficient for
living expenses, compared to 92% of White, non-Hispanic. The average number of years
of education was 12.7 (SD=2.7), with non-White participants reporting a slightly larger
average of 13.2 years (SD=4.0) compared to 12.3 years (SD=2.4) reported by White,
non-Hispanic participants. Total scores of the JHAC-12 reported by the majority of
women in this study were high (range 26-88; M=40.7; SD=4.4).

During this assessment, 3 outliers based on the JHAC-12 were identified;
however, comparison of the 5% trimmed mean and mean values (40.84; versus 40.72,
respectively) indicated appropriateness of keeping the cases in the analysis, since there
was little difference between these means. Inspection of the inter-item correlation matrix
revealed the presence of many coefficients of .3 and above. The overall Kaiser-Meyer-
Olkin (KMO) value was .87, with individual KMO measures all greater than 0.7,
suggesting classifications of ‘middling’ to ‘meritorious’ according to Kaiser (1974).
Bartlett’s Test of Sphericity (Bartlett, 1954) reached statistical significance (p= < .0005),
indicating the data were appropriate for factor analysis. Some participants had missing
data in the demographic variables, with ‘age’ missing most frequently (n=14
participants), followed by income adequacy (missing for six), years of education (missing
for three), and marital status (missing for one item). Considering the large sample size
(N=485), and that participants had complete data on the items of focus (JHAC-12), the
few participants with demographic items missing were retained in this study.
Validity Testing

The PCA was guided by James’ (1994) hypothesis that “three mutually reinforcing themes are important to capture in any empirical measure of John Henryism” (p. 169). For this reason, we elected to initially force a 3-component solution; items with loadings above 0.3 were predetermined to load on a given component. The analysis revealed two components with eigenvalues exceeding 1. These components explained 30.9% and 9.6% of the variance, respectively. Visual inspection of the scree plot (Figure 4.1) indicated a slight break after the second component. Based on Catell’s (1966) scree test and the Kaiser criterion (Kaiser, 1960), we chose to retain two components for further investigation.

The two-component solution explained a total of 40.5% of the variance, with Component 1 contributing 30.9% and Component 2 contributing 9.6%. To aid in the interpretation of these two components, direct oblimin rotation, a rotation commonly used in research involving human behaviors, was performed with the 2-component solution specified (Costello & Osborne, 2005). The rotated solution (Table 4.1) revealed the presence of a simple structure (Thurston, 1947) with two components showing strong loadings and the majority of variables loading substantially on only one component. Ten items loaded moderately on the first component (all loadings > .4), labeled “commitment to hard work,” while two items loaded highly onto the second component (both loadings > .7), labeled “self-efficacy,” with no major cross-loadings noted on the pattern matrix. Higher loadings indicate a variable is more highly related to the underlying component meaning that “two, three, or more loadings higher than .71 are clearly less trivial than say two loadings of .30 or .40” (Brown, 2009, p.20).
In the two-component solution, items 7 and 11 from the scale revealed low values of communality (< .3); the communalities of the remaining 10 items all exceeded 0.3. “Low values (e.g. less than .3) of communalities could indicate that the item does not fit well with the other items in the component.” (Pallant, 2013, p. 206). In attempt to refine the scale with less items, the two items were removed and the analysis was repeated with the modified scale (JHAC-10), resulting in some improvement of the explained variance. The revised scale (Table 4.2) with 10 items of the JHAC-12 explained a total of 44.6% of the variance, with Component 1 contributing 33.1% and Component 2 contributing 11.5%. The rotated solution indicated a similar simple structure with 8 items (> .4) loading onto Component 1, “commitment to hard work,” and 2 items loading strongly (> .7) onto Component 2, “self-efficacy”. There were no major cross-loadings between the factors. The strongest loading item (.76) of Component 1 (“commitment to hard work”) of JHAC-10 was item 9: “When things get tough, I never lost sight of my goals”; this accounted for 54% of the total variance in the two-component model. The items that loaded the strongest on Component 2 were item 5 (“Sometimes I feel that if anything is going to be done right, I have to do it myself”) and 10 (“It is important for me to do things my way”) with values of .80 and .72 respectively. these accounted for 66% and 53% of the variance, respectively. There was weak correlation between the two components (r = .29).

The pattern matrix of the component structure provides evidence of both convergent and discriminant validity for the JHAC-10 and the JHAC-12 as both analyses resulted in a simple structure with high loadings within items and no major-cross-loadings between items (MacKenzie et al., 2011). Item loadings conclude that within this
sample of older farm women, there are two dominant components “commitment to hard work” and “self-efficacy”. The components are reflective of the agrarian culture indicating face validity of the JHAC.

### Reliability

Scale reliability of the JHAC-12 indicated an acceptable level of reliability ($\alpha=.78$). Assessment of the scale after removing items 7 and 11 (JHAC-10) revealed a high level of internal consistency for the items with an acceptable level of reliability ($\alpha=.76$). The levels of reliability are consistent with previous studies utilizing the JHAC-12 reporting internal consistency ranging from 0.61 to 0.87 (Bronder, Speight, Witherspoon, & Thomas, 2014; Fernander et al., 2003; James, 1994; Maciuba et al., 2013; Reed et al., 2008; Weinrich et al., 1988). Reliability in three separate samples composed of only women report a range from .77 to .87 (Bronder et al., 2014; Clark & Adams, 2004; Fernander & Schumacher, 2008). It should be noted that two of these three studies were samples of African American women and composed of a mixed population of both rural and urban, age range of 18-70 years, and a variety of both educational and socioeconomic levels (Bronder et al., 2014; Fernander & Schumacher, 2008).

### Discussion

The results of this study provide support for the reliability and validity of the JHAC-12 in the sample of older farm women, but when items 7 and 11 are removed, the resulting JHAC-10 model performs slightly better and would reduce the burden of the participants. Regardless of whether 12 or 10 items are used, the results of this study indicated the scale has two dominant themes, “commitment to hard work” and “self-efficacy,” despite James’ (1994) suggestion of 3 dominant themes. The results of two
themes are supported in previous studies (Fernander et al., 2003; Weinrich et al., 1988). It is possible that strong mental and physical vigor (James, 1994) is simply imbedded within the components of commitment to hard work and self-efficacy as a characteristic within those with a strong work ethic and greater self-efficacy (Williams, Wiebe, & Smith, 1992). James (personal communication, February 5, 2019) suggests this is reasonable, as it would be difficult to engage in a high level of coping without energy, optimism, and hope that one’s efforts would reap reward.

The two major themes are reflective of the agrarian culture. The characteristics of the agrarian culture are a set of distinct values. Based on Protestant beliefs, the values include self-reliance, strong family unit, strong work ethic, attachment to the family farm, independence, fundamentalism, and traditional gender roles (Logsdon, 1994; Peck et al., 2002; Swisher et al., 1998). Additionally, higher resiliency and strong work ethic have been shown to be positively associated with choice of an active coping style and a lower tendency to seek avoidance actions (Aspinwall & Taylor, 1992; Carver et al., 1989; Grabowski, Pollak, & Czerw, 2017; Rice & Liu, 2016; Secades et al., 2016). This is further supported in additional studies having shown that those who use more instrumental ways of coping are those who adapt more easily to stressors, have greater self-efficacy, and strive to succeed (Bandura, 1982; Holahan & Moos, 1985). This is suggestive that both the JHAC-10 and JHAC-12 encompass the values and beliefs of the agrarian culture. While the influence of culture is resonated, results of demographic analysis are worthy of discussion.

The women in this study had overall high levels of JHAC-12 with only slight differences noted between White, non-Hispanic and non-White participants. Years of
educational levels were slightly higher in non-Whites. The majority of White, non-Hispanic women reported income sufficient for living expenses, while only three quarters of the non-White women reported adequacy of income for living expenses, yet the non-White women had slightly higher levels of JHAC-12 scores. Both levels of education and socioeconomic variables have been associated with depressive symptoms in studies of farm women (Hanklang, Kaewboonchoo, Morioka, & Plempit, 2016; Roblyer, 2016; Butterworth, Olesen, & Leach, 2012; Stallones & Beseler, 2002). It is curious that levels of active coping are higher within a group of women who may not have income sufficient for living expenses. This poses further questions regarding the extent demographics affect JHAC-12 scores as well as differences of active coping between ethnic groups of farm women.

**Strengths and Limitations**

Strengths of this study include the robust sample size, contribution of knowledge in a typically understudied population and analyses of the JHAC12 within a sample of older farm women; a population in which it has never been assessed. Although the scale was shown to be reliable and valid in this sample of older farm women, the majority of participants were married and from two different geographic areas, limiting the generalizability of the study to all farm women.

**Future Direction**

The results of this study provide support for the use of the JHAC-12 or JHAC-10 as a tool that is reliable and demonstrates convergent and discriminant validity within a sample of older farm women. Further comparison of the scale to other measures of active
coping to examine construct validity within this population will certainly add to our knowledge of active coping among older farm women.

A larger study among farm populations with a more diverse and equal distribution of ethnicity, socioeconomic status, geographic location, age and gender should provide additional insight regarding differences between groups and the effects of these variables on active coping. Additionally, while the two-dominant themes that emerged during this study “commitment to hard work” and “self-efficacy” are clearly aligned with the agrarian culture, a larger study with applied psychometric testing should provide additional information regarding the dimensionality of the scale.

In summary, the ability of the JHAC-12 to encompass the sociocultural influences on active coping within this population with quantifiable results should prove to become an important instrument in advancing our knowledge regarding the resiliency of farm women and allow for comparability across studies to build a larger body of science within this population.
Table 4.1  Summary of Items and Component Loadings(N=485) for Oblimin Rotation
Two-Component Solution for the JHAC-12 (N=485)

<table>
<thead>
<tr>
<th>Item</th>
<th>Component 1</th>
<th>Component 2</th>
<th>Communality</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Commitment to hard work</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9. When things get tough, I never lost sight of my goals</td>
<td>.74</td>
<td>-.17</td>
<td>.51</td>
</tr>
<tr>
<td>12. Hard work has really helped me to get ahead</td>
<td>.70</td>
<td>-.13</td>
<td>.45</td>
</tr>
<tr>
<td>6. It’s not always easy, but I find a way to get things done</td>
<td>.64</td>
<td>-.17</td>
<td>.38</td>
</tr>
<tr>
<td>4. If things don’t go the way I want, it makes me work even harder</td>
<td>.63</td>
<td>.02</td>
<td>.41</td>
</tr>
<tr>
<td>1. I can make what I want of my life</td>
<td>.62</td>
<td>.07</td>
<td>.41</td>
</tr>
<tr>
<td>2. If I make up my mind to do something, I stay with it</td>
<td>.58</td>
<td>.07</td>
<td>.37</td>
</tr>
<tr>
<td>3. I like doing things other people thought could not be done</td>
<td>.50</td>
<td>.19</td>
<td>.34</td>
</tr>
<tr>
<td>7. Very seldom have I been disappointed by the results of my hard work</td>
<td>.48</td>
<td>.06</td>
<td>.25</td>
</tr>
<tr>
<td>8. I stand up for my beliefs</td>
<td>.44</td>
<td>.24</td>
<td>.31</td>
</tr>
<tr>
<td>11. I don’t let my personal feelings get in the way of my job</td>
<td>.42</td>
<td>.18</td>
<td>.26</td>
</tr>
</tbody>
</table>

| **Self-Efficacy**                                                    |              |              |             |
| 5. Sometimes I feel that if anything is going to be done right, I have to do it myself | .01          | .80          | .64         |
| 10. It is important for me to do things my way                       | .03          | .72          | .53         |

| **Eigenvalues**                                                      | 3.7          | 1.2          |
| **% Variance**                                                       | 30.9         | 9.6          |

*Note: Boldface indicates highest component loadings.*
Table 4.2  Summary of Items and Component Loadings (N=485) for Oblimin Rotation
Two-Component Solution for the JHAC-10

<table>
<thead>
<tr>
<th>Item</th>
<th>Pattern coefficients</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Component 1</td>
<td>Component 2</td>
<td>Communality</td>
</tr>
<tr>
<td>Commitment to hard work</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9. When things get tough, I never lost sight of my goals</td>
<td>.76</td>
<td>.09</td>
<td>.54</td>
</tr>
<tr>
<td>12. Hard work has really helped me to get ahead</td>
<td>.69</td>
<td>-.10</td>
<td>.45</td>
</tr>
<tr>
<td>4. If things don’t go the way I want, it makes me work even harder</td>
<td>.64</td>
<td>-.13</td>
<td>.44</td>
</tr>
<tr>
<td>6. It’s not always easy, but I find a way to get things done</td>
<td>.64</td>
<td>.06</td>
<td>.38</td>
</tr>
<tr>
<td>1. I can make what I want of my life</td>
<td>.62</td>
<td>.09</td>
<td>.43</td>
</tr>
<tr>
<td>2. If I make up my mind to do something, I stay with it</td>
<td>.57</td>
<td>.09</td>
<td>.36</td>
</tr>
<tr>
<td>3. I like doing things other people thought could not be done</td>
<td>.51</td>
<td>.23</td>
<td>.38</td>
</tr>
<tr>
<td>8. I stand up for my beliefs</td>
<td>.43</td>
<td>.26</td>
<td>.31</td>
</tr>
<tr>
<td>Self-Efficacy</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Sometimes I feel that if anything is going to be done right, I have to do it myself</td>
<td>-.009</td>
<td>.81</td>
<td>.66</td>
</tr>
<tr>
<td>10. It is important for me to do things my way</td>
<td>.015</td>
<td>.72</td>
<td>.53</td>
</tr>
<tr>
<td>Eigenvalues</td>
<td>3.31</td>
<td>1.15</td>
<td></td>
</tr>
<tr>
<td>% of variance</td>
<td>33.1</td>
<td>11.5</td>
<td></td>
</tr>
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</table>

Note: Boldface indicates highest component loadings.
Figure 4.1 Initial scree plot with observed Eigenvalues
CHAPTER FIVE

Dissertation Conclusion
Dissertation Conclusion

Discussion

Although increasing rates of suicide and depression have brought the topic of depressive symptoms among farmers to the research forefront, studies specific to farm women and depressive symptoms continue to be limited. Multidimensional influences of farm women’s lives can affect their levels of depressive symptoms. Major influences include the intertwined work-family environment and the role of farm women within their culture. These influences, coupled with the basic emotional and physiological differences between genders, suggest current studies regarding depressive symptoms among farm men may have limited use in regard to farm women and depressive symptoms.

The intimate work-family environment of the family farm can provide contentment from the blend of work and family (Sprung & Jex, 2017; Garkovich, Bokemeir, & Foote, 1995). Conversely, farming can be a stressful occupation where responsibilities of the job and uncertainty of economic future can contribute to higher levels of stress (Burgard & Lin, 2013; Fraser et al., 2005; McIntosh et al., 2016; Roberts & Lee, 1993; Sanne, Mykletun, Moen, Dahl, & Tell, 2004). The stressors of farming are numerous and often out of farmers’ control. The level of stress can be compounded by the environment of the family farm where work-life balance can prove to be difficult as the farm serves as both the work-place and home. The traditional gendered role of farm women within the agrarian culture provides additional physical and mental stress for farm women, increasing farm women’s risk of higher depressive symptom rates.
The purpose of this dissertation was to explore the state of the science of depressive symptoms among a group of older farm women, identify variables commonly associated with depressive symptoms in farm women in the literature, identify variables predicting depressive symptoms in older farm women as well as note differences between those women with low depressive symptoms versus those with high depressive symptoms. In addition, the reliability and validity of the John Henry Active Coping Scale (JHAC-12) within a sample of older farm women was examined. Despite the limitations within each manuscript, this dissertation contributes to the limited knowledge of depressive symptoms among farm women; however, as with most research, while knowledge was added, large gaps were also revealed.

**Synthesis of Findings and Implications**

**Chapter 2: First manuscript.** The purpose of the first manuscript was to determine the state of the science between farm women and depressive symptoms and identify variables shown to be associated with depressive symptoms in farm women. Several reputable electronic databases were employed to perform a systematic review of the literature. The search was based on keywords “farm women” and “depression,” as well as “depressive symptoms,” “mental health of farm women,” and “mental health and farm women.” Thirteen articles published between 1985 and 2016 met the inclusion criteria and were retained for final analysis. The 13 studies represented a well-rounded overview of depressive symptoms among farm women as the studies included were of various geographic, ethnic and age groups.

The results of the literature review revealed leading predictors of higher depressive symptoms among farm women to be increased family conflict, single, poor
health, financial hardship, discrimination, lack of social support, and variables associated with farming as an occupation. Two studies reported living on the farm as protective of high depressive symptoms.

Prevalence of depressive symptoms varied within different subgroups of farm women. Prevalence rate varied by age, geographic location, and ethnic groups. Lower rates of depressive symptoms were noted in farm women when compared to women of the general population not living on farms. Higher prevalence was noted among migrant farm women when compared to White, non-Hispanic farm women and non-farm resident women.

The dated and limited amount of relevant literature confirms the need for additional research to add to the shallow knowledge regarding depressive symptoms among farm women. The limitations in the available literature supports the necessity of future studies to have stronger study designs. The limitations of available research included the majority of studies conducted to-date have been largely of cross-sectional design, data were collected mainly from self-report and possessed sampling limitations. All of the studies in the final review utilized validated tools to measure depressive symptoms; however inconsistency of cut-off values may have contributed to differences in prevalence and/or the use of a variety of validated tools makes comparing results challenging.

The results indicate a need for a longitudinal study to provide answers to contradiction in age and prevalence of depression identified in the literature review, as well as address specific levels of stress over the lifespan of farm women. The lack of studies focusing on minority and migrant workers reveals a large gap in the science.
There were many social and environmental variables identified in the literature as associated with the migrant farm women and their depressive symptoms, but were not a focus in other studies in the final review. A strength-based study can provide more insight regarding the variables identified to protect farm women from high levels of depressive symptoms. Finally, there is a need for consistent utilization of reliable and valid tools of measurement to allow for cross-study comparability.

It remains that the state of the science is in need of more information regarding farm women within the context of their environment, culture, and occupation. This knowledge will provide information to identify appropriate resources and design evidence-based programs to decrease depressive symptoms among farm women.

Chapter 3: Second manuscript. The purpose of the second manuscript was to apply a conceptual framework and examine aspects from the multidimensional elements of farm women’s lives to determine the relationship between variables identified in the review of the literature and their influence on depressive symptoms in a sample of older farm women.

A Modified Biopsychosocial Model (MBPS) was selected as the applicable conceptual model. The framework is reflective of the interrelationship among the influences from the farm women’s social, psychological, biological, environmental, and demographic elements that may affect levels of depressive symptoms.

Multivariable binary logistic regression was used to identify variables predicting depressive symptoms in data from 358 farm women aged 50 and older. The older farm women’s depressive symptoms were predicted by their race/ethnicity, years of education, adequacy of income for vacation, perceived health status, perceived stress level score,
and active coping score. There were also several indicators that the overall mental health of farm women is healthy.

The study also identified significant gaps related to depressive symptoms of farm women. Gaps identified include a lack of research on migrant farm women and other minority farm women, leisure time among farm women, and depth of current studies related to variables affecting their depressive symptoms. A study to include a broader application of the MPSB theory would provide more information of farm women in the context of their role and culture and the relationship of these factors to physical and mental health.

Chapter 4: Third Manuscript. Gaps in the science of farm women and depressive symptoms revealed the lack of tested tools within this population. The purpose of the third manuscript was to establish reliability and validity of the JHAC-12 in a sample of older farm women.

Internal consistency reliability was examined using Cronbach’s alpha and Principal Component Analysis (PCA) was used to investigate the scale in a sample of 485 farm women aged 50 and older.

The analysis supported a two-component structure using direct oblimin rotation in lieu of the developer’s three-component measure, with eight items loading .4 or greater onto Component 1 (“commitment to hard work”) and two items loading strongly onto Component 2 (“self-efficacy”) with values > .7. Item reduction showed support of a more refined, 10-item scale (JHAC-10) increasing the explained variance from 40.5% to 44.6% with fewer items. Reliability was acceptable for the JHAC-10 (Cronbach α = .76) as well as the JHAC-12 (Cronbach α = .77).
Evidence supports the reliability and validity of the JHAC-10 and the JHAC-12 among a sample of older farm women; however, use of the JHAC-10 would decrease participant burden. The ability of the JHAC to encompass the sociocultural aspects of farm women and their coping with quantifiable values supports the continued use of the instrument as an important tool for future studies of farm women and depressive symptoms. The use of the JHAC-10 or JHAC-12 will allow for comparability across studies to build a larger body of knowledge.

Limitations and Future Implications

This study has several limitations. Data utilized to identify variables predicting higher depressive symptoms among older farm women was obtained from a dataset not primarily focused on depressive symptoms, limiting the amount of available information, particularly regarding social and environmental variables. The parent study population was purposively sampled from two different geographical areas (North Carolina and Kentucky) and composed largely of White, non-Hispanic and older farm couples who may experience different stressors secondary to the type of farming or differences in culture, limiting generalizability. Additionally, the original data was collected by cross-sectional design, reflecting only one moment in time in an occupational culture that is highly seasonal.

Future Implications

It is clear that the influences on depressive symptoms of farm women are complex, as there are constant interactions and interrelationships among the social, environmental, biological, psychological, and demographic aspects of the women’s lives. The review of the literature indicates a clear need for research with strong study design, a
broader application of the Modified Biopsychosocial Theory (MBPS) and the consistent use of culturally competent, reliable and valid tools of measurement to further explain the multidimensional influences of farm women’s lives associated with their levels of depressive symptoms.

Studies of depressive symptoms of women have identified some of the same variables as associated with depressive symptoms seen in the older farm women of this study; however, there were results noted here that may be unique to farm women. The women in this study demonstrated resilience, suggesting there may be influences on depressive symptoms related directly to farming and farm life. A hint of this concept is indicated in other studies reporting farm women with prevalence rates of depressive symptoms lower than those studies of women not residing on farms (Kornstein, 1997; Bhatia & Bhatia, 1999; Kessler et al., 1993).

The majority of women in this study reported good or better health and had high levels of active coping. Satisfaction from farm work was identified in this study as protective of high depressive symptoms. Other studies have also reported factors of farm life protecting women from higher depressive symptoms. Living on the farm and actively engaged in farm work as well as satisfaction from farm work was reported as inversely related to levels of depressive symptoms in two studies (Rayens & Reed, 2014; Stallones, et al., 1995). Hillemeier (2008) discussed residing on the farm as a protective factor of depression, while Amshoff & Reed (2005) mentioned the influence of farm tasks as protective. Some of the environmental variables reported in other studies did not emerge in this study. This may simply be due to the lack of available information from the parent study.
or demographics of the sample; such as the average age of the sample, geographic location, type of farming, or farm ownership.

The confirmation of the JHAC as a reliable and valid instrument that encompasses the sociocultural influences of the agrarian culture should prove to be an asset in future studies of farm women and depressive symptoms. Its ability to quantify results of active coping should assist in adding to knowledge as well as allow comparability across studies. Discrepancies noted in the literature review suggests the importance of psychometric testing of instruments to ensure reliable, valid and culturally competent tools for continued research within this unique population.

While information from this dissertation has provided valuable insight to the science of farm women and identified variables and instrumentation to be used in future studies of depressive symptoms, it remains that more research regarding farm women within the context of their environment, occupation, and culture is needed. A study applying the full model MBPS to include specific variables among a diverse population with equal distribution of ethnic, geographical, age, socioeconomic status, type of farming and role of women on the farm would certainly add to the body of knowledge. This was a first glimpse at farm women and depressive symptoms using an existing data set of older farm women. We know little about this topic regarding the farm women who are primary farm operators or those who may be entering farming.

A broader application of the MBPS to include specific variables would provide vital information regarding farm women within the context of their role and culture and the relationship of these factors to their overall physical and mental health. Failure to assess depressive symptoms of the farm woman from a single dimension could result in
missing major factors that may contribute to and/or protect farm women from increasing levels of depressive symptoms. Increasing the knowledge will allow for identification of appropriate resources and evidence-based interventions to decrease depressive symptoms among farm women.
Chapter One


Chapter Two


factors: Results for Spain of the European Health Interview Survey 2014-2015.

*Journal of Affective Disorders, 239*(15), 203-207.


**Chapter Three**


Chapter Four


**Chapter Five**


depression in the National Comorbidity Survey, I: Lifetime prevalence, chronicity

*Journal of Clinical Psychiatry, 58* (15), 12-18.

Report, 65*, 641-645. Retrieved from https://www.cdc.gov/mmwr/volumes/65/wr/mm6525a1.htm

Rayens, M., & Reed, D. (2014). Predictors of depressive symptoms in older rural couples:

Roberts, R., & Lee, E. (1993). Occupation and the prevalence of major depression,
alcohol, and drug abuse in the United States. *Environmental Research, 61*(2), 266-
278.

anxiety and depression: The Hordaland health study. *Occupational Medicine, 54*(2), 92-100.

among Colorado farmers. *Journal of Agricultural Safety and Health, 1*(1), 37-43.

among farm couples. *Journal of Occupational Health Psychology, 22*(2), 218-
224.
Vita

Place of Birth: Harrodsburg, KY

Education

<table>
<thead>
<tr>
<th>Institution</th>
<th>Degree</th>
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<tr>
<td>University of Cincinnati</td>
<td>MSN</td>
<td>Dec 2013</td>
<td>Clinical Specialist, Nursing Education</td>
</tr>
<tr>
<td>University of Kentucky</td>
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<td>Lexington Community College</td>
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Professional Experience

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<tr>
<td>Jan. 2015-present</td>
<td>University of Kentucky College of Nursing</td>
<td>Lecturer, research coordinator, med/surg and public health clinical instructor, clinical coordinator</td>
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<tr>
<td>Aug. 2001-2005</td>
<td>Franklin County Career and Technical Center</td>
<td>Health Sciences Program developer, instructor</td>
</tr>
<tr>
<td>Aug. 2008-2009</td>
<td>Baptist Physicians’ Surgery Center</td>
<td>Staff nurse</td>
</tr>
<tr>
<td>Aug. 2005-2006</td>
<td>James B. Haggin Hospital Harrodsburg, KY</td>
<td>Director, Emergency Department</td>
</tr>
<tr>
<td>June 1991-1992</td>
<td>University of Kentucky Medical Center, Lexington, KY</td>
<td>Staff nurse, Surgical step down</td>
</tr>
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Honors and Awards:

- Fall 2015-present National Institute for Occupational Safety and Health (NIOSH) trainee in the Occupational/Environmental Health Nursing Core (OEHN) of the Central Appalachian Regional Education and Research Center (CARERC)
- May 2012 University of Kentucky College of Nursing, Excellence in Part-Time Teaching

Published Abstracts:


Cheryl Witt
Signature