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Development and Validation of the Perinatal Mental Health Literacy Scale among Latinas

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DEVELOPMENT AND VALIDATION OF THE PERINATAL MENTAL HEALTH LITERACY SCALE AMONG LATINAS

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DEDICATION

My pursuit of a doctoral degree was strongly influenced by my previous clinical work with pregnant/postpartum women, children, and families who trusted me to help them learn new ways to manage previous traumatic events and stressors that were negatively impacting their daily lives. Their struggles and successes, and the extensive clinical training I received to better serve my clients, contributed greatly to the creation of this research study. Further, this research would not have been possible without the support of the El Paso community and the many faculty, mental health, early childhood, and health providers that I reached out to who helped me recruit participants and who supported the goals of my research. After graduation, I hope to continue being involved in community and academic research partnerships that support the mental health needs of residents in our El Paso border region, particularly our youngest children and their families. As such, this work is dedicated to those in our community who experience mental health difficulties and suffer in silence, as well as to those tireless providers who aim to provide a sense of comfort and support. This dissertation is also dedicated to my husband and family, who believed in me that I would get this project done. This was a family effort for sure and there's no one else I would share this project with.

DEVELOPMENT AND VALIDATION OF THE PERINATAL MENTAL HEALTH LITERACY SCALE AMONG LATINAS

by

IRMA Y. TORRES-CATANACH, M.S.

DISSERTATION

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The idea to pursue a doctoral degree, and to focus on the topic perinatal mood disorders, was planted years ago and was reinforced by my previous clinical work addressing complex mental health challenges being experienced by pregnant/postpartum women and how these impacted their infants and young children's health, attachment, and development. In this professional journey, I was blessed to have worked with many colleagues who challenged my thinking about psychiatric disorders and the impact of trauma, as I learned to incorporate evidence-based interventions in my clinical work with infant-parent dyads. I'm particularly thankful for my former supervisor Kathleen and colleagues Trasie, Susan, Liz, Sally, Linnea, Shannon, Diana, Jodi, and Robyn, with whom I shared many tears as we described how we were impacted by this work and much needed moments of laughter and reflection that helped us focus on our self-care. I'm also grateful to the many other friendships I developed with other clinicians across NM, particularly our great infant mental health leaders in the state Deb Harris, Jane Clarke, and Soledad Martinez, as we focused on strengthening the need for addressing the mental health needs of infants, toddlers, and their families.

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ABSTRACT

Psychiatric disorders in pregnancy and in the first year after childbirth are considered a significant health complication of the perinatal period (O'Hara & Wisner, 2014). The prevalence of perinatal mood disorders has been shown to be higher among women from racial/ethnic minority groups (Gavin et al., 2011; Melville et al., 2010). As the largest racial/ethnic minority group in the U.S., Latinas are disproportionately affected by these disparities. Despite the volume of research examining the prevalence of and treatment for perinatal psychiatric disorders, there is a dearth of knowledge focused on educational approaches that aim to reduce perinatal mental health disparities. One way to reduce these disparities is to characterize gaps in perinatal mental health knowledge among specific high-risk groups, and target gaps in knowledge to improve symptom reporting and mental health care utilization.

The purpose of this study was to test the psychometric properties of a new survey instrument called the Perinatal Mental Health Literacy Scale (PMHLS), developed to address a gap in the literature. The 34-item PMHLS, written in English and Spanish, further contributes to the small number of instruments currently validated for U.S. Latino populations.

The standardization of the PMHLS in English and Spanish was completed in two phases. In the first phase, a sample of N = 529 Hispanic females of childbearing age completed the preliminary PMHLS (N=269 English, and N=260 Spanish). Exploratory Factor Analysis (EFA), a statistical procedure that reduces a large number of variables into smaller sets of correlated factors, was used to provide evidence of construct validity for this new scale. EFA results suggested that a 27-item, 6-factor model best defined the perinatal mental health literacy construct for both the English and Spanish PMHLS. Reliability analyses showed that the 27 items were a reliable measure of perinatal mental health literacy construct.

Confirmatory Factor Analysis (CFA), another test of construct validity, was conducted with a different sample of Hispanic female participants (N = 142 English and N = 126 Spanish). CFA results showed that the hypothesized 6-factor model identified in EFA, composed now of the same 25 items in both the Spanish and English PMHLS, was a good fit for the perinatal mental health literacy construct. Tests of known-groups validity, convergent, and discriminant validity further demonstrated strong, consistent evidence for the construct validity of the PMLHS, indicating that the revised PMHLS was a valid measure of perinatal mental health literacy for English and Spanish-speaking Latinas of childbearing age. Validation of this instrument with Latinos will contribute to the development of interventions that strive to decrease perinatal mental health disparities among this population.

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CHAPTER 1

INTRODUCTION

Mental disorders are a major public health problem with marked consequences for society. Approximately 18% of adults in the U.S. have a diagnosable mental disorder in a given year, and nearly 4% of American adults currently live with a serious mental illness (NIMH, 2017). Perinatal mental illness, psychiatric disorders that are prevalent in pregnancy and in the first year after childbirth, are a significant health concern during a vulnerable period (O'Hara & Wisner, 2014). Women with psychiatric symptoms during pregnancy have increased risk of preterm births and pregnancy complications, including lower than average birth weight infants, greater likelihood that their newborn will be admitted to the neonatal care unit (Chung et al., 2001; Yonkers et al., 2014), and other negative physical health and birth outcomes, including poorer adherence to medical care and poorer nutrition (Schetter & Tanner, 2012).

Women who experience psychiatric disorders in the postpartum period experience additional adverse health outcomes, including increased risk of smoking, alcohol consumption, and substance use (Leight, Fitelson, Weston, & Wisner, 2010; Marcus, 2009); retained gestational weight gain; and decreased breastfeeding initiation and/or continuation (Meltzer-Brody & Stuebe, 2014). Also, extensive research has shown that infants of mothers with psychiatric disorders experienced impaired maternal-infant interactions (Muzik et al., 2016; Arteche et al., 2011; Feldman et al., 2009; Tietz et al., 2014), with poorer cognitive, motor, emotional, and behavioral development (Grace, Evindar, & Stewart, 2003; Pinheiro et al., 2014). The personal and financial costs of health complications to both mother and infant, along with the psychological consequences of impaired attachment patterns, point to the importance of developing interventions for preventing and treating perinatal mental health disorders.

Mood disorders such as depression and anxiety are the most common psychiatric disorders reported in the perinatal period (Kendig et al., 2017). The prevalence of depression during pregnancy ranges from 6.5%-11%, and approximately 19.2% of moderate or severe depressive episodes occur in the first three months postpartum (Gavin et al., 2005). Most importantly, the presence of suicidal ideation and suicidal intent during this period are of great concern. The prevalence of any anxiety disorder during pregnancy ranges from 13% to 21%, while the prevalence for these disorders in the postpartum period is 11% to 17% (Fairbrother, Young, Antony, & Tucker, 2015). Perinatal anxiety disorders often co-occur with depression and have been shown to be a strong predictor of postpartum depression (Robertson, Grace, Wallington, & Stewart, 2004). With regard to depression, despite its relatively high prevalence and the increased risk for suicide, depression is most likely to be unrecognized by women and undetected during routine perinatal care (Earls, 2010; Evans, Phillippi, & Gee, 2015).

Trauma related disorders, bipolar disorder in pregnancy, and postpartum psychosis are the least common perinatal psychiatric disorders yet present with additional mental health complications for women and infants. With a prevalence rate of 8% (Seng, 2009), PTSD during pregnancy has been shown to be highly correlated with depression, anxiety, and suicidality (Smith et al., 2006). Likewise, bipolar disorder, with a lifetime prevalence at 1-2%, frequently co-occurs with anxiety and substance abuse disorders (Frye & Solloum, 2006; Miklowitz & Johnson, 2006). Approximately 60% to 70% of women with bipolar disorder will experience a mood episode in the perinatal period, with postpartum psychosis being the most salient (Viguera et al., 2007). Although the incidence of postpartum psychosis is rare, at one or two per 1,000 births (Sit, Rothschild, & Wisner, 2006), the occurrence of these episodes should be alarming given the increased risk for suicide and/or infanticide.

BACKGROUND SUMMARY

Risk Factors

Extensive literature has identified different classes of risk factors for perinatal psychiatric disorders. Psychological factors such as a previous history of mental illness at any time during a woman's lifetime (Bayrampour, McDonald, & Tough, 2015; Rich-Edwards et al., 2011), history of childhood abuse (Plant et al., 2013; Robertson-Blackmore et al., 2013), current abuse by an intimate partner (Tiwari et al., 2008; Martin et al., 2006), or experiencing a mood disorder or traumatic event during pregnancy are well-established risk factors for the development of mental illness in the perinatal period (Biaggi, Conroy, Pawlby, & Pariante, 2016). Social stressors such as lack of social support, conflict with current partner, and experiencing adverse life events or high levels of stress are also strongly associated with an increased risk for perinatal mental illness (Biaggi, Conroy, Pawlby, & Pariante, 2016). Finally, obstetric risks such as an unplanned or unwanted pregnancy (Fellenzer & Cibula, 2014; Bunevicius et al., 2009), current or past pregnancy/delivery complications, or history of a pregnancy loss (Chojenta et al., 2014; Gong et al., 2013) have also been found to increase women's risk of developing a perinatal psychiatric disorder (Biaggi, Conroy, Pawlby, & Pariante, 2016).

Disparities

The prevalence of perinatal mood disorders has been shown to be higher among women from racial/ethnic minority groups (Gavin et al., 2011; Melville et al., 2010), women of lower socioeconomic status (Mukherjee et al., 2017; Fellenzer & Cibula, 2014; Glazier et al., 2004), adolescent mothers (Fellenzer & Cibula, 2014; Martini et al., 2015), and women of older reproductive age (Ali et al., 2012; Gavin et al., 2011), and these factors may be additive. Women

who fall in more than one of these demographic categories and who experience one or more of the risk factors for a psychiatric disorder were that much more likely to experience a mood disorder in the perinatal period.

Access to services, sometimes referred to as mental health care disparities, have been shown to disproportionately impact U.S.-born and immigrant Latinos. For example, Latinos of Mexican descent, the largest subgroup, were more likely to underutilize mental health care services (DHHS, 2001), to have more chronic psychiatric disorders (Alegria et al., 2007), and were more likely to accept psychotherapy versus pharmacotherapy (Gonzalez et al., 2010). Latinos with Limited English Proficiency were less likely to identify a need for mental health services, experienced longer duration of untreated disorders, and used fewer healthcare services for mental disorders (Bauer, Chen, & Alegria, 2010). Although there is a relative dearth of literature, findings also demonstrated disparities in perinatal mental health care for Latinas. Among U.S.-born and immigrant Latinas, the prevalence of perinatal depression has been estimated to range from 11% to 50% (Kuo et al., 2004; Lara et al., 2009). Cultural beliefs about mental health, language, expectations of motherhood, and fears regarding the negative social connotations associated with mental health treatment presented additional barriers to help-seeking for Latinas. Identifying interventions that aim to decrease perinatal mental health disparities for these vulnerable subgroups is critical given that Latinos are the largest racial/ethnic minority group in the U.S., representing 18% of the total population (Census, 2018).

Given the urgency and negative health outcomes for both mother and infant, several national organizations have promoted the identification of women at risk for perinatal mood disorders. The American Academy of Pediatrics (AAP) (Earls, 2010) was the first organization to recommend universal postpartum depression screening during infant well-child visits. In

2015, the U.S. Preventive Services Task Force (USPSTF) recommended universal depression screening for pregnant and postpartum women (Siu et al., 2016). In the past year, the American College of Obstetrics & Gynecology (ACOG, 2018) updated earlier recommendations and called for universal depression and anxiety screening to occur at least once during the perinatal period using a validated screening tool, and for a comprehensive evaluation of a woman's emotional well-being to be conducted at the 6-week postpartum visit. Most recently, the USPSTF offered new recommendations for the referral of women at risk for perinatal depression to evidence-based counseling interventions such as cognitive behavioral or interpersonal therapy (USPSTF, 2019). Despite the recommendations for universal screening and the potential risk of suicide, less than half of all obstetricians, family physicians, and pediatricians surveyed ever inquired or screened for PPD (Evans, Phillippi, & Gee, 2015), representing missed opportunities to identify and refer women to mental health treatment (Kerker et al., 2016).

While extensive research has examined the prevalence of various perinatal mood disorders, far less is known about what factors might improve barriers to care and mental health outcomes, particularly among lower-income and racial/ethnic minority women.

In fact, the major contributing factors to the socioeconomic and racial/ethnic disparities in perinatal mental health treatment were determined to be a lack of knowledge among new mothers and family members regarding 1) perinatal mood disorders; 2) providers who treat these disorders; 3) treatments available; and 4) negative attitudes towards treatment (Lara-Cinisomo, Clark, & Wood, 2018). Together these factors define a construct of perinatal mental health literacy. Researchers have concluded that addressing perinatal mental health literacy among high risk mothers is one critical pathway for reducing perinatal mental health disparities.

RESEARCH PROBLEM

Psychiatric disorders in pregnancy and in the first year after childbirth are considered a significant health complication of the perinatal period (O'Hara & Wisner, 2014). A number of factors associated with an increased the risk for developing a perinatal psychiatric disorder include: previous history of mental illness (Bayrampour, McDonald, & Tough, 2015; Rich-Edwards et al., 2011); lack of social support, conflict with current partner (Biaggi, Conroy, Pawlby, & Pariante, 2016); and an unplanned or unwanted pregnancy (Fellenzer & Cibula, 2014; Bunevicius et al., 2009). In the U.S., prevalence of perinatal mental health disorders has been found to be higher among lower-income (Mukherjee et al., 2017; Fellenzer & Cibula, 2014; Glazier et al., 2004) and racial/ethnic minority women (Gavin et al., 2011; Melville et al., 2010), resulting in significant disparities in access to needed mental health care. As the largest racial/ethnic minority group in the U.S., Latinas are disproportionately affected by these disparities. Despite an increased focus on screening, perinatal mood disorders are under-reported by women and undetected during prenatal care (Earls, 2010; Evans, Phillippi, & Gee, 2015).

Despite the volume of research examining the prevalence of and treatment for perinatal psychiatric disorders, there is a dearth of knowledge focused on educational approaches that aim to reduce and eliminate perinatal mental health disparities. One way to reduce these disparities, especially prior to illness onset, is to characterize gaps in knowledge among specific high-risk groups, and once characterized, target gaps in knowledge to improve symptom reporting and mental health care utilization.

Perinatal mental health literacy, an extension of health and mental health literacy, refers to a person's level of knowledge regarding women's mental health needs during pregnancy and up to one year after childbirth. As described above, when literacy is lacking, women are more

likely to underreport symptoms and/or not seek treatment. The first step in targeting literacy must be to determine current gaps in knowledge for a given sub-group. Once literacy is characterized, any identified gaps can be addressed through targeted education. Currently, there are no standardized measures of perinatal mental health literacy in the literature. This research aimed to develop a new perinatal mental health literacy scale using the mental health literacy framework developed by Jorm et al. (1997). The scale was validated among Latinas of Mexican descent that reside in the El Paso border region. The scale was also validated in English and Spanish to ensure the availability of a standardized instrument for Spanish-speaking Latino sub-groups who are at highest risk of undiagnosed and untreated perinatal mental illness.

CONCEPTUAL FRAMEWORK

Jorm et al. (1997) were the first to conceptualize mental health literacy, which they defined as *"the knowledge and beliefs about mental disorders which aid their recognition, management, or prevention."* In their original framework, six components exemplified mental health literacy: 1) ability to recognize specific disorders; 2) knowledge of risk factors and causes; 3) knowledge of self-treatments; 4) knowledge of how to seek mental health information; 5) knowledge of professional help available; and 6) attitudes that promoted recognition and appropriate help-seeking (Jorm et al., 1997). The authors suggested that recognition of disorders and the ability to differentiate them were required for an individual to accurately communicate their distress to a health provider and become connected to appropriate treatment. The key assumption was that knowledge of risk factors and causes of mental health disorders, such as environmental and biological factors, influenced an individual's pattern of help-seeking and response to treatment (Jorm, 2000). Self-help skills, either initiated by the individual or provided by resources the individual has sought out to address their mental health disorder, also promoted

help-seeking. An individual's attitudes towards the label of mental illness or mental health treatment impacted their decision to seek help.

Jorm et al. (1997) initially measured mental health literacy using a vignette interview method. While this methodology has been used extensively in mental health literacy research, several methodological limitations were identified, namely that a lack of a total score or subscale scores precluded assessment of mental health literacy at the level of the individual (O'Connor, Casey, & Clough, 2014; Furnham & Hamid, 2014; Wei, McGrath, & Kutcher, 2015, 2017; Angermeyer & Schomerus, 2017; Spiker & Hammer, 2018). In response to these limitations, researchers developed scale-based measures such as surveys with multiple-choice, dichotomous, or Likert-response options, all of which allowed for the quantification of individuals' levels of mental health literacy, and thus facilitated statistical comparisons (O'Connor, Casey, & Clough, 2014).

The Perinatal Mental Health Literacy Scale (PMHLS) for the current project was modeled after the Mental Health Literacy Scale (MHLS), a standardized measure of mental health literacy in a scale-based format (O'Connor & Casey, 2015). This scale was selected as a model for creating the PMHLS because it measured the main attributes of mental health literacy. Also, the MHLS demonstrated good psychometric properties and was found to have substantial methodological advantages in comparison to existing scale-based measures of mental health literacy (O'Connor & Casey, 2015). Whereas the MHLS measured mental health literacy, the PMHLS measured perinatal mental health literacy. Measures of knowledge related specifically to perinatal psychiatric disorders. Measures of self-help skills and attitudes towards help-seeking were also geared towards the perinatal period. The PMHLS consisted of 34 items and was developed for English and Spanish speakers, further contributing to the small number of

instruments currently validated for U.S. Spanish-speaking Latino populations. In fact, the mental health literacy framework has rarely been applied to Latinos. Validation of this instrument with Latinos will contribute to the development of interventions that strive to decrease perinatal mental health disparities among this population.

PURPOSE OF THE STUDY

The purpose of this study was to test the psychometric properties of a new survey instrument called the Perinatal Mental Health Literacy Scale (PMHLS). The study was innovative in several ways. First, the PMHLS was developed to measure perinatal mental health literacy, and specifically, the components of knowledge and attitudes shown to promote recognition and appropriate help-seeking for psychiatric disorders in the perinatal period. To date, there is no standardized measure of perinatal mental health literacy in the literature, a critical knowledge gap in the measurement of this construct. Secondly, currently there is a dearth of knowledge pertaining to the measurement of mental health literacy among Hispanic/Latino populations in general, and in particular, the study of perinatal mental health literacy among this population. To address this gap, the target sample of Latina women of reproductive age were selected from the El Paso, Texas border region population, currently comprised of 81% Latinos of Mexican descent (Census, 2018), ensuring the relevance of the data to the populations most in need. Finally, this scale aimed to promote interdisciplinary collaboration between mental health, pediatric, obstetric, and community health providers in the promotion of perinatal mental health literacy among women, their partners, and key family members. The inclusion of partners and family members in the subsequent development of educational interventions will be vital to the prevention of perinatal mood disorders among Latinas.

DEFINITION OF TERMS

The conceptual definitions of the scale domains of the PMHLS were as follows:

- attitudes that impact recognition of disorders and willingness to engage in help-seeking behavior
- ability to correctly identify features of a disorder
- knowledge of where to access information and capacity to do so
- knowledge of environmental, social, familial, or biological factors that increase the risk of developing a mental illness
- knowledge of typical treatments recommended by mental health professionals and activities that an individual can do to improve their mental health
- knowledge of mental health professionals and the services they provide

Perinatal mental health literacy: the total score obtained by adding all items on the PMHLS. The minimum score that could be obtained is 34, while the maximum score would be 170. A higher score was indicative of a higher level of perinatal mental health literacy.

Perinatal period: period of time that includes pregnancy up until the first year after childbirth

HYPOTHESES AND RESEARCH QUESTIONS

The following research questions focused on testing the psychometric properties of the English and Spanish versions of the PMHLS among Latino women of childbearing age:

1) Which items in the PMHLS best measured the construct of perinatal mental health literacy?

a. Hypothesis 1: Exploratory Factor Analysis (EPA) would demonstrate that the proposed items within each subscale correlated strongly with one another, indicating that the subscales were a measure of perinatal mental health literacy.

2) Was the PMHLS a reliable survey instrument in both languages?

a. Hypothesis 2: Measures of internal consistency, namely Cronbach's Alpha and item total correlations, would demonstrate that individual items are related to their corresponding subscale and contributed to the measurement of perinatal mental health literacy.

3) Was the PMHLS a valid assessment of perinatal mental health literacy, as demonstrated by Confirmatory Factor Analysis (CFA), known-groups validity, and relationship to two other measures?

a. Hypothesis 3: CFA and statistical analyses of known groups, convergent, and discriminant validity would demonstrate that the PMHLS was a valid measure of perinatal mental health literacy for both English and Spanish speaking Latinas.

4) Did selected demographic variables predict perinatal mental health literacy in this study sample?

a. Hypothesis 4: As compared to Latinas who did not advance beyond a high-school education (whether or not high school graduation was achieved), Latinas who completed post high-school education would demonstrate a higher level of perinatal mental health literacy as evidenced by higher scores on the PMHLS.

b. Hypothesis 5: As compared to Latinas living at or below the federal poverty level, Latinas living above the poverty level would demonstrate a higher level of perinatal mental health literacy as evidenced by higher scores on the PMHLS.

SIGNIFICANCE AND RATIONALE OF THE STUDY

Mental health disorders are a major public health problem and present significant health complications in the perinatal period (O'Hara & Wisner, 2014). While extensive research has examined the prevalence of various perinatal mood disorders, less is known about what interventions improve barriers to care and improve mental health outcomes, particularly among lower-income women and women from racial/ethnic minority groups. Contributing factors to the socioeconomic and racial/ethnic disparities in perinatal mental health treatment are a lack of knowledge among new mothers and family members regarding 1) perinatal mood disorders; 2) providers who treat these disorders; 3) treatments available; and 4) negative attitudes towards treatment (Lara-Cinisomo, Clark, & Wood, 2018). Together these factors define a construct of perinatal mental health literacy.

To date, there is no standardized measure of perinatal mental health literacy. The validation of the PMHLS would address a significant gap in the literature. The research showing the association of these factors with disparities in the treatment of perinatal mental health disorders suggested that addressing perinatal mental health literacy among high risk mothers was one critical pathway for reducing disparities in the treatment of perinatal mental health. Using a participant sample comprised of individuals of Hispanic/Latino descent was another contribution to the literature, given that there are limited standardized measures of mental health or perinatal mental health that have been validated with Latino English and Spanish-speaking samples.

LIMITATIONS

The validation of the PMHLS was conducted at one moment in time and intended to describe the level of perinatal mental health literacy among Latinas in the El Paso border region. Findings from this cross-sectional study may provide a springboard for future research in quantifying perinatal mental health literacy with other populations and/or developing interventions to address gaps in perinatal mental health literacy. Cross-sectional studies, however, cannot determine causal relationships between variables. Furthermore, convenience sampling was used, as participants were approached at university, medical, pediatric, and public settings. For hypotheses involving group comparisons, the group criteria were adjusted to accommodate the demographic characteristics of the recruited sample.

CHAPTER 2

LITERATURE REVIEW

This chapter will start with a consideration of two central constructs that guided the development of the PMHLS: health literacy and mental health literacy. The literature pertaining to health literacy will provide a historical overview and address current research trends and challenges regarding the definition and measurement of this construct. Mental health literacy will then be discussed. Considered a derivative of health literacy, over time mental health literacy has evolved as its own unique construct. The objectives of previous mental health literacy measurement tools and ongoing methodological challenges in quantifying mental health literacy will be considered. The chapter will conclude by addressing the current literature on perinatal mental health and current trends with regards to the prevalence of mood disorders among pregnant and postpartum women in the United States. There is a major knowledge gap in the standardized measurement of perinatal mental health literacy, and an argument will be made that a valid and reliable measure of perinatal mental health literacy is critical to the health and well-being of women of childbearing age. Another major knowledge gap concerns the needs of Latina mothers. Currently, Latinos make up 18% of the total U.S. population (Census, 2018) and yet their representation in the health, mental health, and/or perinatal mental health literacy literature is extremely limited. This research focuses on the perinatal mental health needs of Hispanic/Latino women. To establish the need for this research and the development of a new instrument, this section will discuss what is currently known regarding perinatal health outcomes among U.S. Hispanic/Latino women.

2.1 Health Literacy Overview

The origins of health literacy in the U.S. began around the same time that measurement of individuals' abilities to read and write was first attempted, that is, at the start of the 19th century. When military and labor experts wanted to determine the levels of ability individuals needed to function on the job, they established a criterion of three years of schooling to indicate "functional literacy" (Berkman, Davis, & McCormack, 2010). Educational achievement became the surrogate indicator of functional literacy. Over time, as our educational systems advanced, so did awareness of the value of education level to employment. Currently, a college degree is believed to indicate attainment of the skills and knowledge required for success in a competitive labor market (Spellings, 2006).

While American literacy levels increased over time, education researchers noted that a significant segment of the adult population could not read proficiently. By the 1980's, policy makers began to consider the impact of low literacy on health and for the first time, designated low literacy as a significant "public health" concern with negative consequences for our country's economic, social, and defense competitiveness (Kaestle et al., 1991). Once designated a public health concern and because of the grave implications, the Department of Education was tasked with improving the definition of functional literacy by defining it according to something more than just word knowledge and numeracy skills. Soon, higher order cognitive functions such as information processing, working memory, problem solving, and quantitative skills were added to this definition of "functional literacy" (Kaestle et al., 1991).

By the end of the 20th century, using updated measures, it was estimated that approximately 90 million Americans lacked adequate literacy skills (Berkman, Davis, & McCormack, 2010). To develop effective interventions for improving literacy rates, researchers

and policy makers considered a broad range of variables that impacted, and could be impacted, by literacy. The links among low literacy, health status, and health outcomes suddenly became very apparent (Berkman et al., 2004). These discoveries of connections between literacy and health guided the creation of a new field of study referred to as "health literacy".

Definitions of Health Literacy. Health literacy is a complex, multidimensional, social construct created with the goal of identifying an individual's level of knowledge of their health needs. The original definition of health literacy followed outdated definitions of functional literacy and tested only basic reading and numeracy skills as applied to health care content (AMA Ad Hoc Committee, 1999). While many variations evolved, the definition of health literacy perhaps most often cited in the U.S. and found in the Institute of Medicine's initial report on health literacy, is *"the degree to which individuals have the capacity to obtain, process, and understand basic health information and services needed to make appropriate health decisions"* (Kindig, Panzer, & Nielsen-Bohlman, 2004). This definition was included as a goal in the *Healthy People 2010* national health initiative and reinstated, with many underlying objectives, as a *Healthy People 2020* goal (ODPHP, 2018). Subsequent definitions have included a broad range of abilities, including for example, the interpersonal, cognitive, and social skills that an individual requires to act in response to their knowledge of health.

After these initial definitions of health literacy were published, in the U.S. alone, at least ten other iterations have been proposed. These alternate definitions referenced an individual's capacity to perform health care tasks such as reading and comprehending medical information and making decisions that positively impact one's health. Each definition has included consideration of additional factors, such as whether the measurement of health literacy should include the community. For example, some definitions have incorporated the term "public

health literacy", which is defined as *"the degree to which individuals and groups can obtain, process, understand, evaluate, and act upon information needed to make public health decisions that benefit the community"* (Freedman et al., 2009). Another factor in newer definitions referenced the influence of the health care system on an individual's attainment of health literacy. This concept considered the continuous and dynamic interactions individuals and communities have with larger public or private systems that provide health care services and coverage. A further consideration for the expansion of the health literacy definition was that much of the interpersonal contact with individual providers for the exchange of information has been replaced by technology. Thus, the value and adequacy of health technology is now considered a critical component of health literacy that extends well beyond the individual measures of reading and numeracy skills.

One important consideration that pertained to both the definition and measurement of health literacy was how it might change over time within individuals. A common assumption in most of the proposed definitions was that an individual's health literacy is static. This assumption may be a remnant of early definitions of functional literacy, which presumed that a person's level of education defined a fixed level of reading and numeracy skills; certainly, the capacity to attain health literacy is likely determined by whether a person can read. As literacy in the U.S. has improved however, many researchers have argued convincingly that, among literate populations, health literacy is not at all a static trait but instead is a dynamic trait that changes as individuals or groups experience health information in a variety of settings, which help them to develop a wider range of skills that contribute to greater use of health information (Zarcadoolas, Pleasant, & Greer, 2005). In turn, health systems have tried to respond to this potential for a dynamic exchange that builds health literacy and benefits health, by ensuring that

individuals are provided with health information that is easily understandable and that facilitates positive interactions around health.

Health Literacy Research

Since its inception, the field of health literacy has grown exponentially as researchers, practitioners, and health care systems addressed the effects of low health literacy on health status, health care utilization, increased barriers to care, and premature death (Berkman et al., 2004; Baker et al., 2007; Berkman et al., 2011). Whereas earlier studies demonstrated evidence of low health literacy across varied conditions and health-related skills, recent publications have identified significant relationships between low health literacy and wide-ranging health outcomes. For instance, in the meta-analysis conducted by Berkman and colleagues (2011), evidence of increased use of emergency room care and increased risk for hospitalization among elderly individuals with low health literacy was found. The meta-analysis also suggested that lower health literacy can explain, or partially explain, racial/ethnic disparities in health outcomes (Berkman et al., 2011). Also, researchers have identified and isolated variables such as health-related knowledge, self-efficacy, and beliefs, and found that these variables can mediate the relationship between health literacy and outcomes, although the strength of these relationships vary between studies (Berkman et al., 2011).

Literature such as this on the multiple serious health outcomes that are associated with low health literacy has provided the impetus for improving the way health literacy is conceptualized. Nonetheless, and perhaps surprisingly, there continues to be no clear consensus among researchers and practitioners on the factors within individuals that produce health literacy (Pleasant, 2014). This lack of consensus has seriously hampered the development of a conceptual framework describing how health literacy develops, how it is actuated, and how it

might be improved (Pleasant, 2014). Furthermore, and perhaps more importantly, the lack of a conceptual definition has led to a lack of an operational definition of health literacy, and this has seriously impacted the scientific measurement of this construct. More research is needed to determine which factors define health literacy so that the construct can be subjected to rigorous testing. These actions will further contribute to the development of valid and reliable quantitative measures of this complex, multidimensional construct.

The Measurement of Health Literacy. Over the last three decades, more than fifty tools have been developed to measure health literacy in a variety of contexts (Haun et al., 2014). As previously mentioned, the first and most commonly referenced tools were constructed to measure only reading literacy and numeracy skills. One of these measures was the Rapid Estimate of Adult Literacy in Medicine (REALM), developed by Davis and colleagues (1991). Validated with a sample of 207 male and female adult patients, the REALM measured literacy in a health context by having the patient read and pronounce medical printed text. REALM test scores reflected the number of correctly pronounced words and served as an indicator of an individual's estimated grade-equivalent reading level (Dumenci et al., 2013). The authors suggested that patients reading at the 9th grade level or below would likely experience more difficulties in understanding verbal and written health information than patients reading above the 9th grade level. A shorter version of this scale, consisting of seven items and designed for use in clinical settings, was also developed (Arozullah et al., 2007).

Another tool frequently used and referenced in more recent health literacy validation studies was the Test of Functional Health Literacy for Adults (TOFHLA) (Parker et al., 1995). The TOFHLA, validated with a sample of 505 English and Spanish-speaking male and female adult patients, measured an individual's comprehension of print and numerical information

commonly found in medical settings. The reading comprehension portion consisted of 50 incomplete short phrases borrowed from health materials where a patient was instructed to select the missing and correct word out of four options provided. The numeracy portion consisted of 17 items borrowed from hospital forms and prescription vials that measured an individual's comprehension of the instructions provided by these items.

Additional scales developed after the TOFHLA measured functional literacy across various health conditions and populations. Besides the commonality of measuring functional literacy, however, none of the validation studies for these instruments included an explicit definition of health literacy. In the absence of a construct definition, many have argued that what these and other similar measures are capturing cannot be known. Clearly, a construct definition is critical for establishing what is being measured.

In response to the exclusive focus on functional literacy in previous health literacy measurement tools, another group of scales emerged that sought to measure health literacy skills by using self-report of day-to-day health-related experiences. One of the first and most widely referenced measures was the Health Literacy Questionnaire (HLQ), developed by Osborne and colleagues (2013). This scale consisted of 44 items measuring nine domains of health literacy that sought "to capture the lived experiences of people attempting to understand access and use of health information and health services" (Hawkins et al., 2017).

In contrast to previous measurement tools, the HLQ was based on the more expansive health literacy definition of the World Health Organization (WHO), which defined health literacy as *"the cognitive and social skills which determine the motivation and ability of individuals to gain access to, understand, and use information in ways which promote and maintain good health"* (Osborne et al., 2013). Furthermore, the inclusion of nine health literacy

domains in the conceptual framework of the HLQ was thought to better capture the complexity of this definition and identify a broader range of competencies beyond functional literacy. The use of a content validity driven and "grounded" methodology, in which the input from patients and experts served as the basis for scale development, provided an acceptable representation of individual's real-world interactions within specific health contexts (Hawkins et al., 2017).

While the inclusion of an operational definition in contemporary measurement tools is a methodological improvement, there is still a long way to go in the objective measurement of "health literacy". For example, subjective, self-report measures such as the HLQ have the potential to introduce social bias, in that participants may respond to questions in what they perceive as socially acceptable ways to respond. Also, subjective measures do not explain how different domains of health literacy, for example, evaluation of health material and functional literacy, are related. By contrast, measures such as the TOFHLA or the REALM are considered objective measures, yet they do not measure any domain of health literacy beyond functional literacy. Furthermore, the measures referenced are unable to show how those domains of health literacy are related to health outcomes (Pleasant, 2014). Recognition of the complexity and multidimensionality of health literacy has contributed to the increased relevance of this construct for health researchers, practitioners, and policymakers. Nonetheless, building a comprehensive approach to the measurement of health literacy is imperative to the identification of health needs and the development of effective interventions that serve to improve the health of individuals and communities (Pleasant, McKinney, & Rikard, 2011).

2.2 Health Literacy among Latinos

The 2003 National Assessment of Adult Literacy (NAAL) was the first publication that identified substantially lower levels of health literacy among Hispanics/Latinos as compared to other populations (Jacobson, Hund, & Soto Mas, 2016), linked primarily to lower levels of English language fluency. Nonetheless, regional and clinical studies have consistently found lower levels of health literacy among Latinos, underlining considerable implications for Latino health outcomes. For example, Koskan, Friedman, & Messias (2010) completed a systematic review of published studies that examined the measurement of health literacy among Latinos. This review found that most studies published from 1992-2008 had used the Spanish version of the TOFHLA to measure Latino's English-language reading comprehension of various health topics including diabetes, HIV, cancer, and asthma, among other conditions. A smaller proportion of the revised studies measured English-language word recognition among Latinos using the modified REALM scale. A consistent finding across the 28 studies reviewed was that Latinos, particularly Spanish-speaking Latinos, those with lower levels of education, and foreign-born, had low levels of health literacy (Koskan, Friedman, & Messias, 2010). Recent studies with Spanish-speaking adults have also found lower levels of health literacy among this group, with Limited English Proficiency being a particular vulnerability for poor health outcomes (Sentell & Braun, 2012). Given these findings, it is imperative that researchers and practitioners continue work towards developing Spanish-language health information to improve health literacy levels among a growing U.S. Latino population.

Since the 2003 NAAL study, there has not been another national dataset that has measured the health literacy levels of Latinos in the U.S. More importantly, no studies could be found that tested health literacy in patients' primary language, and then examined health

outcomes relative to patients' performance on tests provided in Spanish.

Many researchers have noted the urgent need for updated and reliable data among the various Latino subpopulations and subgroups, including immigrant, Spanish-speaking, and bilingual Latinos (Jacobson, Hund, & Soto Mas, 2016). One pressing concern is that while many Latino health literacy studies have been published since the NAAL study, the findings have been inconsistent. For example, Sentell & Braun (2012) found that various ethnic groups with Limited English Proficiency (LEP) and low health literacy were the groups with the worst health status, with Latinos constituting 44% of this group. Another study done with Latinos living on the U.S.-Mexico border reported low health literacy among a sample of Hispanic immigrants whose first language is Spanish, with English proficiency being the strongest predictor of health literacy (Jacobson, Hund, & Soto Mas, 2016).

Health literacy has generally been defined as the ability to understand *English* health information, and it is a construct embedded within the U.S. healthcare system, which is predominantly English-speaking (Jacobson, Hund, & Soto Mas, 2016). Therefore, it is possible to conclude that research findings pertaining to the health literacy of Latinos is primarily a reflection of poor English language skills.

In a separate study on the U.S.-Mexico border, health literacy levels among Hispanic college students were higher as compared to the general Hispanic population (Soto Mas, Jacobson, & Dong, 2014). Students in this study (N=331) were asked to complete the Newest Vital Sign instrument in English. More than 90% of students in this study scored at the adequate level of literacy, demonstrating a literacy level comparable to the general U.S. population with an equivalent level of education and higher than the general Hispanic adult population (Soto Mas, Jacobson, & Dong, 2014). Moreover, in a study of Spanish-speaking Latinos in Arkansas,

Boyas (2013) found that Latinos (N=123) who were more linguistically acculturated and educated were more likely to have increased levels of health literacy compared to less educated and acculturated Latinos.

Researchers that have examined health literacy among Latinos have attributed discrepancies across studies from the use of multiple definitions of "health literacy". For example, Latino health literacy studies completed prior to 2008 referenced definitions from the Institute of Medicine, the American Medical Association, definitions of general literacy, and definitions developed by individual study authors (Koskan, Friedman, & Messias, 2010). Studies completed in the last decade, however, have made references to the expanded definitions of health literacy, such as the role of community health, interactions with health care systems, and the role of technology in the exchange of health information in the development of health literacy. Even today, most Latino health literacy studies have relied on translated versions of the TOFHLA or REALM to assess functional literacy skills but do not measure the more complex domains of health literacy such as actions taken related to health decisions. Thus, lack of an operational definition of health literacy also impacts the examination of this construct among Latinos. Furthermore, additional considerations for the roles of language and culture must be included in the examination of health literacy among ethnically and linguistically diverse Latino populations.

Researchers have also identified methodological challenges in the measurement of health literacy among Latinos. These have limited the generalizability of the findings and the development of culturally appropriate interventions. For example, researchers have not used validated Spanish-language assessment tools but instead have depended on translations of standardized measures validated with English-speaking samples (Koskan, Friedman, & Messias,

2010). In other words, new assessment tools have not been properly validated with the target population, resulting in the potential for substantial measurement error (Nguyen et al., 2015). Furthermore, the impact of language on health literacy has not been extensively studied, particularly among Latinos whose first language is Spanish but who show varying degrees of English proficiency (Jacobson, Hund, & Soto Mas, 2016). Thus, cultural, regional, and linguistic differences within the various Latino racial/ethnic groups need to be included in any measurement of health literacy.

2.3 Mental Health Literacy Overview

In contrast to the national and international attention given to health literacy, as reflected in the literature on this subject, mental health literacy has been relatively neglected (Jorm, 2000). There is no question that mental health plays a role in physical health (Mojtabai et al., 2010; Berkman et al., 2011), which in turn suggests the critical importance of understanding and promoting mental health literacy. Moreover, mental health critically impacts all aspects of an individual's life and can determine one's capacity to achieve life goals. Australian researchers were among the first to introduce the construct of mental health literacy. In their seminal study, Jorm and his colleagues (1997) surveyed a national, representative male and female adult sample (N=2,031) regarding their beliefs of the causes of mental disorders. Results of this study showed that half of the population misattributed the causes of major mental disorders, such as depression and schizophrenia, to an individual's personality. These findings were the first to underscore the importance of addressing public misunderstandings of mental disorders, and more specifically, finding ways to decrease stigma associated with mental illness.

The Mental Health Literacy Construct

Jorm and his colleagues (1997) were the first to discuss mental health literacy, which they defined as *"the knowledge and beliefs about mental disorders which aid their recognition, management, or prevention."* In their definition, six components exemplified mental health literacy: 1) the ability to recognize specific disorders; 2) knowledge of risk factors and causes; 3) knowledge of self-treatments; 4) knowledge of how to seek mental health information; 5) knowledge of professional help available; and 6) attitudes that promoted recognition and appropriate help-seeking (Jorm et al., 1997). The authors suggested that recognition of disorders and the ability to differentiate them were required for an individual to accurately communicate their distress to a health provider and become connected to appropriate treatment. Knowledge of risk factors and causes of mental health disorders, such as environmental and biological factors, influences an individual's pattern of help-seeking and response to treatment (Jorm, 2000).

It was also pointed out that the ability to use self-help skills (e.g. social support) to remedy psychological distress was another important component of mental health. Self-help skills are either initiated by the individual or provided by resources the individual has sought out to address their mental health disorder. To employ self-help skills, the individual must have learned skills that then allow him or her to obtain reliable sources of mental health information. Interestingly, the authors observed that most individuals will seek out mental health resources from individuals they know well, or from distant sources such as the internet, before they access resources from a health or mental health professional (Jorm, 2012). It was also proposed that an individual's attitudes towards the label of mental illness or mental health treatment will impact their decision to seek help.

Mental Health Literacy Research

At the turn of the last century, research exploring the public's mental health literacy proliferated in Western countries. In Australia, the 1995 survey conducted by Jorm and his colleagues was followed by another national survey in 2003-2004 that tracked changes over eight years in the recognition of beliefs regarding mental disorders. Findings from this study demonstrated that, as compared to the previous decade, recognition of depression and schizophrenia had improved. Public perceptions of mental health interventions among a representative adult sample (N=2,001) also improved (Jorm, Christensen, & Griffiths, 2006).

The research on mental health literacy led to the development of national depression initiatives such as *Beyondblue* and *Mental Health First Aid*, which focused on increasing community awareness around depression and providing support to individuals experiencing a mental health crisis (Jorm, 2012). In Germany, researchers examined changes in the public's attitudes towards mental illness, noting improvements over 10 years in adult's attitudes (N=4,005) towards psychiatric treatment (Angermeyer & Matschinger, 2005). Improvements in mental health literacy were attributed in part to the implementation of the *Nuremberg Alliance Against Depression Initiative* (Dietrich et al., 2009). Finally, researchers in the United Kingdom (U.K.) analyzed trends in public attitudes towards people with mental illness in England and Scotland from 1994 to 2003 (Mehta et al., 2009). Their findings demonstrated worsening attitudes towards individuals with mental illness, among a representative sample (N=2,000), towards the end of the study compared to the beginning (Jorm, Christensen, & Griffiths, 2006).

Researchers in the United States (U.S.) also used population-based measures to analyze trends in knowledge, attitudes, and help-seeking behaviors. For example, Mojtabai (2007) evaluated changes in American's attitudes towards mental health treatment seeking by

comparing findings from two cross-sectional population surveys conducted in the early 1990's (N=8,089) and the early 2000's (N=9,282). Findings indicated modest improvements in help-seeking over the decade analyzed, with more significant improvements in attitudes towards mental health noted among young adults ages 18-24 (Mojtabai, 2007). Another study that evaluated changes in public attitudes toward individuals with mental illness analyzed participant's responses to the 1996 and 2006 (N=1,956) General Social Survey Mental Health Modules (Pescosolido et al., 2010). Results showed a marked increase in the understanding of the neurobiological causes of mental illness among Americans, which was positively associated with an increased acceptance of mental health treatment. However, the acceptance of neurobiology as a primary cause of mental illness did not lead to a decrease in stigma towards individuals with mental health disorders (Pescosolido et al., 2010).

Researchers in developing countries also examined mental health literacy among their populations. In 2008, Ganasen et al. completed a systematic review of mental health literacy studies conducted in developing countries between 1990 and 2006 and found that the public's knowledge of mental disorders and evidence-based treatment was very low. However, in the studies reviewed, researchers consistently found that participants' cultural attitudes and beliefs were closely linked to causal attributions of mental illness that in turn influenced their help-seeking preferences for traditional healers versus psychiatric providers (Ganasen et al., 2008). Furnham and Hamid (2014) conducted a separate review of mental health literacy studies published between 2000 and 2014 and found that in developing countries, young adults and women consistently had higher recognition of mental illness and were more likely to seek professional help for a mental disorder. Across studies conducted in different non-Western countries, participants showed greater recognition of depression than schizophrenia; in studies

that assessed other mental disorders, recognition rates were low (Furhnam & Hamid, 2014).

Research on mental health literacy in developing countries has been limited. In their examination of the literature, researchers identified several contributing factors, including: limited or no expenditures for mental health research; a lack of national mental health policies; scarcity of mental health service providers and researchers; inadequate infrastructure required to conduct research including roads and communication systems; and low gross national product (Sharan et al., 2009). The authors also suggested that even when shared mental health research priorities were identified, institutional efforts are needed to increase funding and human capacity to conduct such research.

Mental health literacy studies have primarily used population samples from Australia and Europe who adhere to Western notions of mental health. Much less is known about culturally and linguistically diverse populations who have varied opinions regarding mental illness and help-seeking (Ganasen et al., 2008). Furthermore, knowledge of the similarities and differences in the causes, descriptions of, and treatment for mental illness within the same culture is also limited (Choudhry, Mani, Ming, & Khan, 2016). In the U.S., a developed country with a large culturally and linguistically diverse population, mental health research has focused extensively on identifying structural barriers to care (Gonzalez et al., 2010; Mojtabai et al., 2011). Investigations of the cultural knowledge regarding mental health among different U.S. racial/ethnic groups and its effect on attitudes and help-seeking is lacking. Given the burden of mental disorders, it is imperative that research efforts examine the knowledge and belief systems of different racial/ethnic groups to facilitate the development of evidence-based, culturally informed interventions.

Current Advances in Mental Health Literacy Research

The original definition of the mental health literacy construct described earlier (Jorm et al., 1997) is considered by many to be the "gold standard" definition (Spiker & Hammer, 2018). In recent years, researchers have identified various associations between its core components and facets of mental health. For example, some researchers have argued for the inclusion of constructs such as the positive aspects of mental health, or the knowledge and abilities necessary to benefit mental health (Bjornsen, Ringdal, Espnes, & Moksnes, 2017; Kusan, 2013) and self-efficacy, or an individual's belief in their ability to achieve a goal, related to help-seeking (Wei, 2017). Scholars have noted that the addition of these components to the mental health literacy construct are aligned with the components of health literacy. Whether these additional components would improve the definition and measurement of "mental health literacy" will require a great deal of additional research.

Another perhaps more central concern raised by researchers has been the lack of an operational definition for the construct. When the definition was first introduced, Jorm et al. (1997) did not explain the theoretical basis for mental health literacy nor assess the validity or reliability of their vignette tool. Scholars who extended this research proceeded to use this definition without questioning how the individual components of mental health literacy - knowledge, attitudes, and help-seeking - were defined or measured. Furthermore, no consensus on the definition was obtained among scholars. Without a consensus, researchers developed different definitions and measurements for the construct. These actions have made it much more difficult to define mental health literacy the same way across studies and has limited the ability to make inferences or comparisons (Spiker & Hammer, 2018). Before expanding this definition further, it is imperative that researchers bring consistency and precision to the definition of

mental health literacy. Establishing a shared definition will ultimately lead to a consistent measurement of mental health literacy across studies (Spike & Hammer, 2018).

The Measurement of Mental Health Literacy

A principal requirement for investigating any construct is that it must be operationally defined. Establishing an operational definition ensures agreement among researchers about what components should and should not be included and how these components may be measured (Spike & Hammer, 2018). The absence of an operational definition for mental health literacy has caused inconsistencies regarding the measurement of this construct. In the last twenty years, scholars have developed tools that measured the individual components of knowledge, attitudes, and help-seeking, as well as those that measured all components combined. However, only recently have their psychometric qualities been subject to formal examination (O'Connor, Casey, & Clough, 2014). Reliable and valid measurement of mental health literacy is vital to the development of measurement instruments that can yield results with the potential to improve interventions and thus contribute to positive mental health outcomes.

The first approach to the measurement of mental health literacy was the vignette interview method developed by Jorm et al. in 1997. This method consisted of two vignettes, presented to study participants, describing individuals that demonstrated DSM-IV diagnostic criteria for depression or schizophrenia. The depression vignette in Jorm et al.'s study (1997), stated the following:

"*John is 30 years old. He has been feeling unusually sad and miserable for the last few weeks. Even though he is tired all the time, he has trouble sleeping nearly every night. John doesn't feel like eating and has lost weight. He can't keep his mind on his work and puts off*

making decisions. Even day-to-day tasks seem too much for him. This has come to the attention of John's boss who is concerned about his lowered productivity."

The schizophrenia vignette was similar in length and content, with the behavioral descriptions representing corresponding diagnostic symptoms.

After a participant read each vignette, they were asked two open-ended questions: "*What would you say, if anything, is wrong with John? How do you think John could best be helped?"* After qualitative responses were collected, participants were given a series of questions with possible response options. Additional questions related to a participant's level of mental health knowledge, beliefs regarding risk factors, causes of mental disorders, need for professional help, and attitudes towards individuals with these conditions were given. Scoring consisted of adding individual item responses and weighing percentages of each response so that comparisons between groups could be made (O'Connor, Casey, & Clough, 2014).

Since its inception, the vignette method has been extensively used in mental health literacy research. Advantages of this methodology included its ease of administration and the ability to use established psychiatric diagnostic criteria to collect measures of knowledge, attitudes, and help-seeking behaviors across diverse populations. Although the vignette method was originally developed to measure depression and schizophrenia literacy, researchers evaluating anxiety (Paulus, Wadsworth, & Hayes-Skelton, 2015) or focusing on specific populations (e.g. adolescent males, Bruno, McCarthy, & Kramer, 2015) have modified this method accordingly. Furthermore, the vignette method has been used extensively in non-Western, developing countries where it has been translated into various languages. Altogether, more than thirty vignettes have been developed in the mental health literacy literature, addressing a wide range of psychiatric disorders, populations, and data collection methods (Angermeyer &

Schomerus, 2017; Furnham & Hamid, 2014).

While the vignette method has provided valuable information regarding mental health knowledge, beliefs, and help-seeking behaviors, several researchers have addressed its methodological limitations (O'Connor, Casey, & Clough, 2014; Furnham & Hamid, 2014; Wei, McGrath, & Kutcher, 2015, 2017; Angermeyer & Schomerus, 2017; Spiker & Hammer, 2018). Originally, using the scores obtained for answers following reading of the vignettes, mental health literacy was calculated at the level of the study population based on the number of subjects scoring above a pre-defined level, which could then be used to compare populations and/or monitor change over time. The lack of a total score or subscale scores, however, precluded assessment of mental health literacy at the level of the individual (O'Connor et al., 2014). Since comparisons within the scale could not be made, understanding differences among the components of health literacy and thus change over time was not possible. Perhaps most importantly, the vignette questions had not been submitted to measurement standardization procedures and this lack of clarity made it difficult to distinguish what and how each component was being measured. The vignette questions were also not based on established knowledge and did not allow for a correct or incorrect answer to be given, leaving interviewers to make determinations about how to score individual responses (O'Connor, Casey, & Clough, 2014). Altogether, the vignette method's scoring process called into question its accuracy in measuring the components of mental health literacy.

Given the psychometric issues identified in the vignette method, researchers began to develop scale-based measures such as surveys with multiple-choice, dichotomous, or Likert-response options (O'Connor, Casey, & Clough, 2014). These measures included a scoring system that allowed for the assessment of an individual's mental health literacy and the

application of statistical analyses. At the same time, while new tools allowed for a more accurate measure of differences in mental health literacy and identification of possible areas for intervention, very little focus was given to the quality of the measurement tools being developed. Scale development is a rigorous process whereby the researcher must demonstrate evidence of the reliability and validity of an instrument. Tests of the psychometric properties of the mental health literacy tools have identified substantial limitations in their ability to measure mental health literacy (O'Connor, Casey, & Clough, 2014; Wei et al., 2015; Jung, von Sternberg, & Davis, 2016; Angermeyer & Schomerus, 2017; Wei et al., 2017).

For example, using the Consensus-based Standards for the Selection of Health Measurement Instruments (COSMIN) (Mokkink et al., 2006) checklist to guide their assessment of the methodological quality of these instruments, Wei et al. (2015, 2016, 2017) reported the following issues: (1) of the 401 mental health literacy studies identified in the literature, almost half were conducted with young adults, primarily post-secondary students in the health professions; (2) most studies were conducted in developed countries, notably the U.S., Australia, United Kingdom, and Canada; (3) 111 stigma measures, 69 knowledge measures, and 33 help-seeking measures were reported in the literature; (4) of these, only 65 stigma measures, 14 knowledge measures, and 10 help-seeking measures reported and evaluated their psychometric properties; and (5) the remaining measures either reported limited psychometric criteria or were not validated at all. O'Connor et al. (2014) reported similar findings in their evaluation of existing mental health literacy tools and noted discrepancies in sample sizes, variations in the number of domains being measured even when a scale purported to measure all domains of mental health literacy, and limited information regarding design procedures, sample demographics, and rigor in psychometric assessment.

In their analysis of 478 population-based attitude surveys published between 2005-2014, Angermeyer & Schomerus (2017) found comparable methodological limitations: (1) over two-thirds of studies were conducted in Europe, Australia, and the U.S.; (2) 80% used correlational, cross-sectional analyses; (3) 44% used the vignette method, with many using a translated or modified version of the original; (4) only 20% used instruments with established psychometric criteria; and (5) most studies were descriptive in nature, with only 12% based on an established theoretical framework. Furnham & Hammid (2014) identified challenges with the use of the vignette method in developing countries, whereby scholars used vignettes that were validated with a different population, modified existing vignettes, or devised their own; none of these measures were empirically tested with the target population prior to use.

Comparisons between groups that follow Western ideals of psychology/psychiatry and those that do not are acutely problematic, especially when individuals from non-Western cultures assign religious or supernatural causes to the development of mental illness. Angermeyer & Schomerus (2017) and Furnham & Hammid (2014) cited the lack of published cross-cultural studies, affirming that comparisons between cultures are difficult to make when groups differ in the ways that mental illnesses are defined, understood, and treated. Furthermore, Ganasen et al. (2007) indicated that the term "mental health literacy" implied literacy in mental disorders and evidence-based treatments, most of which have been developed in Western countries. Individuals residing outside of the developed world will inherently be less familiar with mental health disorders, but nonetheless have obtained knowledge about mental illness from other sources. When evaluating culturally and linguistically diverse populations, it is important for researchers to acknowledge the cultural and religious beliefs that influence mental health literacy and incorporate these notions in the development of measurement scales and interventions.

Angermeyer & Schomerus (2017) quantified the percentage of population-based attitude research conducted in different regions of the world and noted wide discrepancies between countries that produced a large proportion of the research and those that produced a minimal amount. Specifically, scholars noted that Latin America produced 4.6% of population-based attitude research, with 3.6% of that research conducted in Brazil alone. Hence, a significant gap in the literature exists with regards to research examining the mental health literacy of Latinos. This discrepancy is compounded by the existing literature on mental health disparities among Latinos living in the U.S. (Bauer, Chen, & Alegria, 2010; Gonzalez et al., 2010; Lopez et al., 2012). The development of valid and reliable tools is a vital first step in the creation and assessment of culturally and linguistically appropriate interventions aimed at reducing mental health disparities among Latinos.

2.4 Mental Health Literacy among Latinos

Approximately 18% of adults in the U.S. have a diagnosable mental disorder in a given year, and nearly 4% of American adults currently live with a serious mental illness (NIMH, 2017). Mental illness exerts a great toll on an individual, negatively impacting health, productivity, coping skills, relationships, and potential contributions to society. Mental disorders place a significant economic and emotional burden on families and communities who experience the direct and indirect costs of caring for a loved one with a debilitating disorder. Mental disorders are among the leading cause of disability, accounting for approximately 13.6% life years lost to disability and/or premature death (Murray et al., 2013). With continued growth in life expectancy, the long-term burden of mental disorders is expected to increase (Trautmann, Rehm, & Wittchen, 2016). For these and other reasons, mental disorders are a major public health problem with marked consequences for society.

Despite the availability of mental health treatment options for many disorders, access to mental health treatment is not equally shared among all Americans. In 2001, the U.S. Surgeon General's Report titled *"Mental Health: Culture, Race and Ethnicity"* concluded that the greatest burden of mental illness fell on the largest racial and ethnic minority groups (U.S. DHHS, 2001). As defined by the Centers for Disease Control and Prevention (CDC), racial/ethnic mental health disparities referred to *"great differences between populations with respect to mental health and the quality, accessibility, and outcomes of mental health care"* (Safran et al., 2009). Latinos, the largest racial/ethnic group in the U.S., have been greatly impacted by mental health disparities. Before providing an overview of Latino mental health disparities, a demographic overview is warranted because American citizenship, or the lack thereof, plays a central role in the ability of Latinos of Mexican and Central American descent to access health care, specifically mental health care.

Demographics. The latest U.S. census data (2018) indicated that Latinos represented 57.5 million people, or 18% of the population, with a projected increase to 24% of the total population by 2050. The largest minority racial/ethnic group, Latinos include individuals of Mexican, Puerto Rican, Cuban, Central American, Spanish, and South American descent. Latinos of Mexican descent, including U.S.-born citizens and immigrants, comprised the largest subgroup, representing 63.3% of the U.S. Latino population, while Puerto Ricans, the second largest subgroup, made up 9.5% (Pew Research, 2017). U.S.-born Latinos represent 65.6% of the total Latino population, while 34.4% of Latinos are immigrants (Pew Research, 2017). English and Spanish are the primary languages of Latinos, with 60% reporting English proficiency and 64% reporting that they speak Spanish at home (Pew Research, 2017).

Also, Latinos represent nearly one-third of the 43.7 million immigrants coming to the

U.S. annually, with immigrants from Mexico and Central American countries largely accounting for these numbers (Pew Research, 2018). Most immigrants are in the country legally, while one fourth of the total immigrant population, or 10.7 million, are unauthorized. As of 2016, Mexicans represented 5.4 million of the total number of unauthorized immigrants (Pew Research, 2018). While there has been a notable decline in the last decade in the number of Mexicans entering the U.S. without authorization, immigration from Central America grew during this period and currently represents about 1.85 million of the unauthorized (Pew Research, 2018). Latino immigrants who are recent arrivals to the U.S. are generally younger, poorer, less educated, and primarily Spanish-speakers (Pew Research, 2018). Moreover, most unauthorized immigrants, primarily those of Mexican origin, have lived in the U.S. for more than ten years (Pew Research, 2018). Thus, Latino families of Mexican or Central American descent include members with varying degrees of U.S. citizenship, including for example those that are U.S. citizens, those that are legal residents, those with temporary protection from deportation, and those that are unauthorized immigrants.

Latino Mental Health Disparities

The mental health disparities literature of the past thirty years has consistently referenced the structural, sociocultural, and linguistic barriers Latinos face in obtaining quality mental health services. Population characteristics, such as low educational attainment and higher levels of poverty and uninsured status, contribute to these disparities (Vega et al., 2007). Furthermore, Latinos have the highest uninsured rate of any racial/ethnic group, with nearly half comprised of undocumented immigrants who are ineligible for health coverage. Lack of insurance, cultural differences in the perceptions of mental health, poor health literacy, language barriers, and lack of culturally competent providers substantially impact how Latinos interact with the U.S. mental

health system of care.

The U.S. Surgeon General's Report (2001) on racial/ethnic mental health disparities emphasized that Latinos are more likely to underutilize mental health care services. Specifically, less than one in 11 Latinos of Mexican descent sought care from a mental health provider and fewer than one in 5 sought care from a general health provider (DHHS, 2001). Furthermore, the mental health care Latinos did receive was of poor quality compared to other groups. Evidence from national epidemiological surveys conducted after this landmark report expanded on these findings. The following surveys detailed substantial differences in mental health service use between Latino ethnic subgroups, immigrant Latinos, and Spanish-speaking Latinos.

The National Epidemiological Survey on Alcohol and Related Conditions (NAESC) (N=43,093) examined lifetime prevalence rates of mental disorders and found that non-Hispanic Whites had the highest risk of psychiatric morbidity, followed by Mexican Americans. Mexican immigrants, however, were found to have the lowest risk of lifetime prevalence of mental disorders compared to non-Hispanic Whites and Mexican Americans (Grant et al., 2004). This finding was remarkable given the stressors immigrants experience in adapting to a new culture and despite their low socioeconomic status.

The National Latino and Asian American Study (NLAAS) (N=4,600) reinforced previous findings of the 'immigrant paradox' effect, whereby Latino immigrants demonstrated the lowest risk for lifetime mental disorders (Alegria et al., 2007). This finding, however, was only applicable to Mexican immigrants and no other Latino subgroups. By comparison, Mexican Americans and Whites were found to have similar mental health needs but the level of chronicity and access to specialty care was worse for Mexican Americans. Furthermore, Puerto Ricans had the highest overall prevalence rate of mental disorders among the Latino ethnic

groups assessed while Cubans had the highest rates of mental health service use (Alegria et al., 2007). The NLAAS was the first study to demonstrate Latino subgroup variability in lifetime risk for psychiatric disorders and encouraged further research into the cultural factors that are protective of psychopathology across each subgroup.

Gonzalez et al. (2010) analyzed data from the NIMH Collaborative Psychiatric Epidemiology Surveys (CPES) to examine the prevalence of depression and adequacy of depression care among the five major U.S. racial/ethnic groups (N=15,762). Researchers found that despite a comparable need for treatment among all groups, Mexican Americans who met diagnostic criteria for depression in the previous year were the least likely to obtain either psychotherapy or pharmacotherapy, the two options found to be most effective in treating depression (Gonzalez et al., 2010). However, when treatment was obtained, Mexican Americans were more likely to prefer psychotherapy over pharmacotherapy. Researchers indicated that health insurance partially explained disparities in depression care for Mexican Americans, but receipt of insurance coverage did not ensure that individuals were receiving guideline concordant treatment (Gonzalez et al., 2010).

Although previous epidemiological studies highlighted the lower risk for lifetime mental disorders for Mexican immigrants, very little is known about their interactions with health systems when immigrants demonstrate psychiatric symptoms and seek care. In their study of Mexican Latinos living in California (N=3,000), Vega, Kolody, & Aguilar-Gaxiola (2001) reported that immigrants diagnosed with a mental disorder in the previous year were less likely to seek specialty mental health care when compared to U.S.-born Latinos, but when they did seek care, immigrants disproportionately used primary care clinics and emergency room services. Even so, 80% of Mexican immigrants received no treatment for their recent mental health

problems from either formal or informal sources of care (Vega, Kolody, & Aguilar-Gaxiola, 2001). Length of residency was a contributing factor to higher rates of psychiatric morbidity among Mexican immigrants living in the U.S. for more than thirteen years (Vega et al., 1998).

Recent research studies have explored the role of Limited English Proficiency and the unique stressors of immigration that negatively impact the mental health of Latino immigrants. Bauer, Chen, & Alegria (2010) examined the NLAAS data to assess the impact of Limited English Proficiency on access to care for Latinos with mental disorders. Their findings indicated that Latinos with Limited English Proficiency were significantly less likely to identify a need for mental health services, experienced longer duration of untreated disorders, and used fewer healthcare services for mental disorders (Bauer, Chen, & Alegria, 2010). In their studies of Latino immigrants living in the South, Coffman & Norton (2010) and Cabassa, Lester, & Zayas (2007) found that the overwhelming demands of immigration placed new immigrants at greater risk for depression. Finally, in a systematic review of mental health service use among immigrants in the U.S., Derr (2015) found that Latino immigrants used mental health services at lower rates than U.S.-born Latinos despite an equal or greater need, Latino immigrant adolescents were significantly less likely to receive needed care, and undocumented Latino immigrants had the lowest rates of mental health service use. Like U.S.-born Latinos, Latino immigrants also faced similar structural barriers to access of mental health care, but the demands of their immigration experience and their limited English proficiency exacerbated the degree of disparities in obtaining needed care.

The findings from studies that have examined mental health disparities among Latinos have offered extensive documentation of their prevalence and highlighted possible interventions to reduce and eliminate those disparities. Besides appeals to address structural inequalities in

access to health care and improvements to the socioeconomic status of Latinos (Zambrana & Carter-Pokras, 2010), researchers have also stressed the need to educate Latinos regarding mental health disorders. Lopez et al. (2012) emphasized that one way to reduce disparities in mental health care, especially at illness onset, was to address the limited mental health literacy that may account, in part, for Latinos' low use of services. This recommendation is particularly critical to Latinos with Limited English Proficiency, given that they are less likely to perceive a need for treatment or seek treatment and are more likely to experience longer periods with an untreated mental disorder (Bauer, Chen, & Alegria, 2010). Relevant factors such as previous interactions with health care systems, cultural understandings of mental health, and knowledge of how or where to go to get mental health treatment contribute to identification of need and help-seeking behaviors for mental health care. Evaluation of these mental health literacy components can contribute to the development of interventions that reduce Latino mental health disparities.

Mental Health Literacy among Latinos

The mental health literacy framework developed by Jorm et al. (1997) (see pages 19-20 above) was based on six key components that emphasized knowledge of the causes and risk factors of mental disorders, beliefs about mental health, and attitudes that promoted recognition of a disorder and facilitated help-seeking. Despite the growing evidence of mental health disparities among Latinos and the potential role of mental health literacy in reducing these disparities, the mental health literacy framework has rarely been applied to this population.

The Latino mental health studies that were reviewed did not reference all six components of mental health literacy but primarily measured attitudes towards specific disorders such as depression or psychosis. Fewer studies have focused on the attainment of mental health knowledge or the measurement of help-seeking behaviors. For instance, Alvidrez (1999)

examined how attitudes towards mental illness and mental health services predicted mental health service use among a sample (N=185) of Latina immigrants, African American, and non-Hispanic White women receiving care in a public hospital. In terms of attitudes, Latinas were more likely to believe that "problems should not be talked about outside the family", that mental illness is stigmatizing, and that mental illness is not caused by biological factors (Alvidrez, 1999). These attitudes, in addition to Latina immigrant's limited interaction with the mental health care system, resulted in the lowest use of mental health services among this group of women.

Cooper et al. (2003) conducted a survey with Latino, African American, and non-Latino White adult primary care patients (N=829) who had met diagnostic criteria for a Major Depressive Episode in the past year to evaluate their level of agreement with psychotherapy or medication treatment for depression. Latinos were more likely to have negative beliefs about antidepressants, less likely to view medications as an acceptable treatment option, but more likely to accept psychotherapy (Cooper et al., 2003). Researchers noted that negative beliefs about medication treatment did not fully explain the disparities seen among Latinos. An evaluation of patients' mental health literacy would therefore contribute to the development of interventions that modify attitudes towards depression treatment and consequently improve care.

Cabassa, Lester, & Zayas (2007) assessed perceptions of depression and attitudes towards treatment with a convenience sample of Latino immigrants in a primary care clinic (N=95). Standardized measures such as questionnaires and a vignette depicting an individual with major depression, as well as open-ended questions, were used. Latino immigrants perceived depression to be a serious condition caused by interpersonal and social factors and held positive attitudes towards psychotherapy and negative attitudes towards antidepressants, a finding consistent with

previous literature (Cabassa, Lester, & Zayas, 2007; Cooper et al., 2003). Furthermore, researchers found that Latino immigrant's English language proficiency, years of education, experience of depressive symptoms, and previous use of mental health services also influenced their perceptions of depression and its treatment. Researchers noted that half of the sample had very little to no knowledge about depression treatments, which suggested that increasing the mental health literacy in Latino immigrant communities would make a significant impact in improving attitudes towards depression treatment (Cabassa, Lester, & Zayas, 2007).

The findings from this last study guided the development of psychoeducational interventions to improve depression literacy among Latinos. For example, Cabassa, Molina, & Baron (2012) developed a *fotonovela*, a culturally informed depression literacy tool written in a comic book format that included visual elements, an entertaining storyline, and educational messages regarding depression. A study with a pretest/posttest randomized design evaluated the effectiveness of the *fotonovela* to increase depression knowledge, decrease stigma, and increase intentions to seek treatment relative to a depression text pamphlet among a community sample of Latino immigrant male and female adults with limited English proficiency (N=157) (Unger et al., 2013). Compared to the control group that received a depression pamphlet, the experimental group had a significantly larger decrease in the perception of stigma associated with antidepressant and mental health care (Unger et al., 2013). The *fotonovela* intervention was then replicated with a clinical sample of Spanish-speaking Latina immigrants at high risk for depression (N=142) recruited from a community clinic and delivered with the assistance of *promotoras* (Hernandez & Organista, 2013). Using a similar randomized design, results indicated significant posttest improvements in depression knowledge, self-efficacy to identify the need for treatment, and decreased perception of stigma in the experimental as compared to the

control group (Hernandez & Organista, 2013).

A different research group developed a culturally informed, psychoeducational intervention to improve psychosis literacy among Spanish-speaking Latinos. Lopez et al. (2009) developed a Power Point presentation with culturally relevant examples of music, videos, art, and a mnemonic device named *La CLAve* (the clue) that highlighted key psychosis symptoms. This intervention was presented to a sample (N=95) of community residents and caregivers of a relative with schizophrenia, and comparisons between the groups were made regarding gains in level of psychosis knowledge, efficacy beliefs, attributions to mental illness, and professional help-seeking (Lopez et al., 2009). Researchers reported increases across the four domains in the group of community residents and increases in psychosis knowledge and efficacy beliefs in the caregiver group. Casas et al. (2014) evaluated the findings of two subsequent studies that used *La CLAve*, the first being a randomized study that used community residents and medical students from Mexico (N=125) and the second study that used a single-subjects design with a sample of Spanish-speaking Latinos in the U.S. (N=93). Results from these two studies indicated that the DVD version of *La CLAve* produced a range of psychosis literacy gains for Spanish speakers in both the U.S. and Mexico (Casas et al., 2014). Finally, a more recent example geared towards improving suicide literacy among Latino immigrants (N=78) used a brochure, a brief, passive form of a psychoeducation intervention compared to previous interactive models. Participants who received the suicide brochure demonstrated increases in suicide literacy but did not demonstrate changes in the perception of stigma associated with suicide or improved attitudes towards professional help-seeking (Dueweke & Bridges, 2017).

Measurement of Mental Health Literacy among Latinos

To date, only a small number of studies have evaluated the knowledge, attitudes, and help-seeking behaviors of Latinos using the mental health literacy framework developed by Jorm et al. (1997). The few scales that have measured specific components of mental health literacy have focused on perceptions of mental illness and stigma. While these cognitive and affective aspects of attitude development have been shown to influence help-seeking behavior, the scales developed thus far do not provide a full picture of the varied types of attitudes that Latinos have about mental health. Furthermore, the development of measures that quantify Latinos' level of mental health knowledge or help-seeking behavior has lagged in comparison. A thorough understanding of mental health literacy in Latino populations grounded in validated measures is critical to the development of interventions that intend to decrease mental health disparities.

In previous studies, researchers that measured Latinos' beliefs and attitudes towards mental health treatment used either individual items from measures validated with English-speaking samples or created their own measures. For example, Alvidrez (1999) used items from an attitude scale developed almost twenty years earlier to assess Latina's attitudes towards mental health treatment. Although the individual items were translated, the modified scale was not validated with Spanish-speaking Latinas prior to use. Cooper et al. (2003) measured beliefs regarding depression treatment by using five items from a scale that the researchers had generated in previous studies. However, the psychometric properties of the original scale were not reported in this study nor was there an indication of whether this scale had been previously validated with a specific Latino subgroup or with Spanish-speaking Latinos.

In their study of depression literacy among Latino immigrants, Cabassa, Lester, & Zayas (2007) used a standardized depression vignette adapted from the Mental Health Module of the

1996 General Social Survey (Link et al., 1999) and the Illness Perception Questionnaire (IPQ-R) (Moss-Morris et al., 2002) to measure knowledge and perceptions of depression among a sample of low-income, Spanish-speaking Latino immigrants. Although the vignette was translated into Spanish using back-translation techniques, there was no indication that the translated vignette was validated with a Spanish-speaking Latino sample prior to use. Researchers pilot tested a translated version of the IPQ-R with this sample and reported that their modified IPQ-R scale demonstrated good face validity and reliability (Cabassa, Lester, & Zayas, 2007). However, the study did not include any evaluation of these psychometric properties nor report evaluations of stronger measures of validity.

Based on the preliminary validation of the IPQ-R with a Latino sample, Cabassa et al. (2008) conducted a validation study of the IPQ-R adapted by the researchers for use with English and Spanish-Speaking Latinos with depression. Confirmatory factor analysis (CFA) was conducted to test the construct and discriminant validity of the modified, 27-item IPQ-R using a clinical sample of low-income, predominantly Spanish-speaking Latino immigrant adults diagnosed with depression (N=339). A final model composed of 24 items exhibited adequate goodness-of-fit indices and factor loadings and satisfactory internal consistency between the five subscales, demonstrating evidence of construct and discriminant validity (Cabassa et al., 2008). Although this scale established validity in measuring perceptions of depression among primarily Spanish-speaking Latino immigrants, similar findings could not be generated for Latinos with English proficiency given their small sample size (N=46) in this study. No further validation efforts of this instrument with other Latino subgroups have been found in the literature.

Interian et al. (2010) examined the psychometric properties of four stigma measures using a sample of Latino primary care patients with depression (N=200). Researchers

administered two established measures: The Perceived Discrimination Devaluation scale (PDD) (Interian et al., 2010), and the Social Distance scale (SD) (Link et al., 1987). The Stigma Concerns about Mental Health Care scale (SCMHC), consisting of three items from a separate measure (Cabassa & Zayas, 2007), and the Latino Scale for Antidepressant Stigma scale (LSAS), developed from a qualitative analysis of antidepressant stigma concerns of Latinos (Interian et al., 2007), were also administered. Measures were translated into Spanish using back-translation techniques but were not validated with a Spanish-speaking sample prior to use. The factor analytic results provided support for the reliability and construct validity of the SCMHC, SD, and LSAS, with limited support of validity for the PDD (Interian et al., 2010). However, the correlations between the measures were low, indicating that each scale was measuring a unique component of stigma.

Researchers that evaluated the efficacy of the *fotonovela* depression literacy tool used a combination of validated measures such as the Depression Stigma Scale (DSS) (Griffiths et al., 2004), the Latino Scale for Antidepressant Stigma (LSAS) (Interian et al., 2010), the Stigma Concerns about Mental Health Care (SCMHC) (Cabassa & Zayas, 2007), as well as scales they developed to measure depression knowledge, willingness to seek depression care, self-efficacy in identifying depression in oneself and in others (Unger et al., 2013; Hernandez & Organista, 2013). Although all scales followed appropriate translation techniques, researchers did not report the psychometric properties of their self-created scales. Conversely, Lopez et al. (2009) and Casas et al. (2014) used a series of scales composed of open-ended questions to measure different components of psychosis literacy, including symptom identification, efficacy beliefs, illness attributions, and recommended help-seeking. High interrater agreement in coding of open-ended questions was used to assess psychosis literacy.

Published studies of Latino mental health literacy have several methodological limitations and have been largely exploratory. More specifically, past studies have typically not reported the psychometric properties of the measures used to assess individual components of mental health literacy. Also, while researchers would appropriately translate scales, reports of the psychometric properties of the translated scales were scant. Only one study used measures previously validated with Latinos. Finally, sampling has been very limited and restricted the variability of samples studied; most of the studies included low-income, older, insured, Spanish-speaking immigrant women of Mexican descent. These sampling characteristics make it difficult to generalize findings to Latinos from varied demographic and ethnic subgroups. Furthermore, lack of sampling variability made it difficult to identify differences in the development of mental health literacy among Latino subgroups and in the subsequent development of interventions aimed at improving those skills. It was also noted that a limited number of longitudinal studies have been conducted to measure gains in mental health literacy over time.

Summary

The mental health disparities literature has demonstrated clear evidence of the many access barriers to quality mental health care faced by Latinos. Epidemiological studies with large Latino samples provided critical evidence of the differences in access and mental health care utilization patterns among Latino subgroups (Berdahl & Torres Stone, 2009). Current research indicated that these disparities continue to grow and impact more vulnerable groups of Latinos, particularly low income, immigrant Latinos with limited English proficiency. Given the continued growth of the Latino population in the U.S., it is imperative that researchers, practitioners, and policy makers maintain a concerted effort to reduce the burden of mental health disparities and improve access to care.

Latino mental health disparities studies frequently referenced how participant's lack of knowledge of mental disorders, negative attitudes towards mental health and obtaining treatment, and use of a restricted set of help-seeking behaviors negatively impacted access to care. These conclusions reflected the components of mental health literacy developed by Jorm et al. (1997), specifically, that Latinos consistently reported having low levels of mental health literacy. Regrettably, there is a dearth of literature evaluating this construct in the U.S. and even less with Latino populations. Recent studies, however, have used this framework to develop interventions that improve depression and psychosis literacy and aim to decrease mental health disparities in this population. These research efforts have provided a foundation with which to further evaluate knowledge, attitudes, and help seeking behaviors across a range of disorders. One mental health research area that would benefit from the inclusion of a mental health literacy framework with Latinos is perinatal mental health.

2.5 Perinatal Mental Health Overview

Late stage pregnancy and the first year after childbirth represent for women an important period of physical and emotional transformation. During this period, happiness in welcoming a new baby may be interspersed with feelings of uncertainty. Accompanying the many adjustments experienced by mothers, this time presents increased vulnerability to developing a new or relapsing from a previous mental disorder (Biaggi, Conroy, Pawlby, & Pariante, 2016). Perinatal mental illness, or psychiatric disorders that are prevalent during pregnancy and in the first year after childbirth, are considered a significant health complication of this period (O'Hara & Wisner, 2014). Women with psychiatric symptoms during pregnancy are at greater risk of experiencing pregnancy complications, increased risk of preterm births, having lower than average birth weight infants, increased likelihood that their newborn will be admitted to the

neonatal care unit (Chung et al., 2001; Yonkers et al., 2014), and negative physical health and birth outcomes, including poor adherence to medical care and poor nutrition (Schetter & Tanner, 2012).

Women who experience psychiatric disorders in the postpartum period experience additional adverse health outcomes, including increased risk of smoking, alcohol consumption, and substance use (Leight, Fitelson, Weston, & Wisner, 2010; Marcus, 2009), retained gestational weight gain, and decreased breastfeeding initiation or continuation (Meltzer-Brody & Stuebe, 2014). Extensive research has shown that infants of mothers with psychiatric disorders demonstrated disturbed sleep patterns (Warren et al., 2006), excessive crying (Petzoldt et al., 2014), and impaired maternal-infant interactions (Muzik et al., 2016; Arteche et al., 2011; Feldman et al., 2009; Tietz et al., 2014). These behaviors contributed to adverse long-term health outcomes for infants, including poorer cognitive, motor, emotional, and behavioral development (Grace, Evindar, & Stewart, 2003; Pinheiro et al., 2014). Altogether, the financial costs of health complications to both mother and infant, along with the psychological consequences of impaired attachment patterns during a critical period of development, point to the value of developing interventions that ameliorate women's perinatal mental health.

The Diagnostic and Statistical Manual of Mental Disorders (5th Ed.) (APA, 2013) operationally defines the major categories of mental health disorders. Of these, mood disorders are more likely to be encountered by women of reproductive age (Kendig et al., 2017) and the most common psychiatric disorders reported in the perinatal period are depression and anxiety disorders, with trauma related disorders, bipolar disorder in pregnancy, and postpartum psychosis being the least common. Although not diagnosed as a mental disorder, the descriptor of *"postpartum blues"* or *"baby blues"* exists at the less severe end of the mental illness spectrum

and consists of women who experienced mild depressive or anxiety symptoms up until the 10th to 12th day postpartum (O'Hara & Wisner, 2014). Researchers estimated the prevalence rate for "postpartum blues" to range from 26% to 84% (O'Hara, Schlechte, & Lewis, 1991), indicating that at least some of these symptoms may be experienced by most women after childbirth. Below is a description of the prevalence, symptoms, and risk factors of the most common psychiatric disorders occurring in pregnancy and up to one year after childbirth:

Perinatal Depression. Perinatal depression is the most common psychiatric disorder, with prevalence at any point in pregnancy ranging from 6.5%-11%, and approximately 19.2% of moderate or severe depressive episodes occurring in the first three months postpartum (Gavin et al., 2005). Furthermore, postpartum depression has been documented up to twelve months after delivery, with prevalence rates at the twelfth month estimated at 6.5% (Gavin et al., 2005). Higher estimates of perinatal depression have been reported for women of lower socioeconomic status, racial/ethnic minority women, military women, immigrants, as well as women who experienced a preterm birth or gave birth to an ill newborn that required intensive care (Norhayati, Hazlina, Asrenee, & Wan Emilin, 2015; Yonkers et al., 2014). More importantly, the presence of suicidal ideation and suicidal intent during this period are of great concern. Although rates of suicide are low in the perinatal period compared to the general female population, suicide is a leading cause of maternal death in the postpartum period among women with psychiatric disorders (Lindahl, Pearson, & Colpe, 2005).

Clinical manifestations of a depressive episode in pregnancy or postpartum include sleep difficulties, mood swings, changes in appetite, persistent sadness, excessive crying, difficulty concentrating, lack of or extreme concern about the baby, and suicidal ideation (Patel et al., 2012; Norhayati, Hazlina, Asrenee, & Wan Emilin, 2015). Depression during pregnancy is most

likely to be unrecognized by women and undertreated by her physician due to similarities to the physical and hormonal changes that occur during pregnancy. Similarly, identification of depression after childbirth is also confounded by the presence of somatic symptoms such as fatigue, sleep, and eating disturbances that are a function of meeting the physical and emotional needs of a newborn. The use of a standardized instrument such as the Edinburgh Postnatal Depression Scale (EPDS) is necessary to assess perinatal depression risk (Cox, Holden, & Sagovsky, 1987).

Perinatal Anxiety. Prevalence of any anxiety disorder during pregnancy has been shown to range from 13% to 21%, while prevalence in the postpartum period was approximately 11% to 17% (Fairbrother, Young, Antony, & Tucker, 2015). Perinatal anxiety disorders are common and often co-occur with depression, despite receiving less clinical and research attention. Researchers have estimated that 60% of women with perinatal depression have pre-existing comorbid psychiatric disorders, and of these, more than 80% are anxiety disorders (Kendig et al., 2017; Wisner et al., 2013). Furthermore, research has demonstrated that anxiety during pregnancy is a strong predictor of postpartum depression (Robertson, Grace, Wallington, & Stewart, 2004). The anxiety disorders reported in the perinatal period include generalized anxiety, panic, social anxiety, obsessive-compulsive disorder and specific phobias. Clinical manifestations of anxiety consist of persistent and excessive worry, difficulty concentrating, fear, panic, severe and recurrent intrusive thoughts, and compulsive behaviors adopted to alleviate worry or panic (APA, 2013). The EPDS is frequently used to assess perinatal anxiety risk; the State Trait Anxiety Inventory (STAI) (Spielberger, 2010) scale has also been validated to identify anxiety risk in postpartum women (Dennis et al., 2013).

Trauma-Related Disorders. Trauma-related disorders are a distinct diagnostic category in the DSM-5, of which post-traumatic stress disorder (PTSD) is the most common diagnosis given. The lifetime prevalence of PTSD among women ranges from 10% - 20%, while prevalence in pregnancy has been estimated at 8% (Seng, 2009). However, PTSD rates are estimated to be as high as 24% during pregnancy for women who belong to a racial/ethnic minority group, are adolescents, poor, and less educated (Seng et al., 2001). PTSD during pregnancy has also been shown to be highly correlated with depression, anxiety, and suicidality (Smith et al., 2006).

Clinical manifestations of PTSD in the perinatal period follow the symptomology described in the DSM-5 (APA, 2013), which include exposure to or direct experience of a traumatic event, with specific symptoms lasting for most of the day every day, for one month or more. Women with trauma histories such as childhood sexual abuse or a prior reproductive trauma history have an increased risk for the reemergence of PTSD symptoms during pregnancy (Muzik et al., 2016). Also, women who had high rates of active PTSD symptoms in late pregnancy were more likely to experience depressive symptoms and reported more difficulties in bonding with their infants in the postpartum period (Muzik et al., 2016). Compared to depression and anxiety, less is known about the assessment of PTSD during the perinatal period and what standardized measures are used to screen for this risk. Systematic screening for trauma exposure and presence of PTSD symptoms at the onset of prenatal care is strongly recommended given the adverse postpartum mental health outcomes.

Bipolar Disorder. As with all of the mental disorders, identification and accurate diagnosis are by far the most important prerequisites for effective treatment (O'Hara & Wisner, 2014). This can be more challenging for a complex syndrome such as bipolar disorder; bipolar

disorder is one of the most difficult psychiatric conditions to diagnose and treat as it requires identification and management of both the manic and depressive aspects of the disorder. According to the DSM-5 (APA, 2013), the diagnosis of bipolar disorder (I or II) requires the presence of *"a distinct period of an abnormally and persistently elevated, expansive, or irritable mood with increased goal-directed activity or energy,"* lasting a minimum of four days for bipolar II disorder, or a minimum of one week for bipolar I disorder, in addition to episodes of clinical depression. As suggested, the diagnosis of depression alone is often missed in pregnant and new mothers. The complex nature of diagnosis and treatment for bipolar disorder presents many greater challenges for pregnant and postpartum women who, when they are diagnosed, are often misdiagnosed with major depression (Viguera et al., 2007). Misdiagnosis of depression in the postpartum period when the mother is actually bipolar is a significant concern, particularly because women may be given antidepressant medication that may inadvertently induce mania or rapid cycling between manic and depressive episodes (O'Hara & Wisner, 2014).

The lifetime prevalence of bipolar disorder is estimated at 1%-2% with onset in late adolescence and early twenties, increasing women's risk during their initial childbearing years (Chessick & Dimidjian, 2010; Yonkers et al., 2004). Bipolar disorder frequently co-occurs with anxiety and substance abuse disorders (Frye & Solloum, 2006; Miklowitz & Johnson, 2006). Moreover, approximately 60%-70% of women with bipolar disorder will experience a mood episode in the perinatal period (Viguera et al., 2007), with postpartum psychosis being the most salient mood episode.

Postpartum Psychosis. Pregnant women diagnosed with bipolar disorder or who previously experienced psychotic episodes are particularly vulnerable to developing postpartum psychosis (O'Hara & Wisner, 2014). The presentation of postpartum psychosis symptoms can

occur immediately after birth and includes mood fluctuation, confusion, marked cognitive impairment, unusual behavior, insomnia, delusions, and visual, tactile, or olfactory hallucinations (O'Hara & Wisner, 2014; APA, 2013). Although the incidence of postpartum psychosis is rare, at one or two per 1,000 births (Sit, Rothschild, & Wisner, 2006), the occurrence of these episodes is very alarming given the increased risk for suicide and/or infanticide. Postpartum psychosis is considered a medical emergency and hospitalization is strongly recommended to ensure safety for both mother and infant, and to initiate psychiatric treatment for the mother (Spinelli, 2009). Assessment of previous psychotic episodes, mood disturbances, treatment compliance, and current sources of support at the initiation of prenatal care can help to inform clinical treatment and help minimize potential harm to mother and her infant.

Risk Factors. Extensive literature has identified different classes of risk factors for perinatal psychiatric disorders. Psychological factors such as a previous history of mental illness at any time during a woman's lifetime (Bayrampour, McDonald, & Tough, 2015; Rich-Edwards et al., 2011), history of childhood abuse (Plant et al., 2013; Robertson-Blackmore et al., 2013), current abuse by intimate partner (Tiwari et al., 2008; Martin et al., 2006), or experiencing a mood disorder or traumatic event during pregnancy are well-established risk factors in the development of mental illness in the perinatal period (Biaggi, Conroy, Pawlby, & Pariante, 2016). Social stressors such as lack of social support, conflict with current partner, and experiencing adverse life events or high levels of stress are also strongly associated with an increased risk (Biaggi, Conroy, Pawlby, & Pariante, 2016). Finally, obstetric risks such as an unplanned or unwanted pregnancy (Fellenzer & Cibula, 2014; Bunevicius et al., 2009), current or past pregnancy/delivery complications or history of a pregnancy loss (Chojenta et al., 2014; Gong et al., 2013) have also been found to increase women's risk of developing a perinatal mood

disorder (Biaggi, Conroy, Pawlby, & Pariante, 2016).

Addressing Women's Perinatal Mental Health Needs

Given the urgency and negative health outcomes for both mother and infant, several national organizations have promoted the identification of women at risk for perinatal mood disorders. The American Academy of Pediatrics (AAP) (Earls, 2010) was the first organization to recommend universal postpartum depression screening during infant well-child visits. That same year, the American College of Obstetrics & Gynecology (ACOG) highlighted the importance of depression surveillance during the perinatal period but noted that there was insufficient evidence supporting universal screening (ACOG, 2010). In 2015, the U.S. Preventive Services Task Force recommended universal depression screening for pregnant and postpartum women with the caveat that screening only take place *"when adequate systems are in place to ensure accurate diagnosis, effective treatment, and appropriate follow-up care"* (Siu et al., 2016).

In 2018, ACOG updated its recommendations and called for universal depression and anxiety screening to occur at least once during the perinatal period using a validated screening tool, and for a comprehensive evaluation of a woman's emotional well-being to be conducted at the 6-week postpartum visit (ACOG, 2018). The ACOG committee also emphasized that practitioners should initiate medical therapy if necessary, have systems in place to facilitate referrals to mental health providers, and be able to track treatment outcomes. The U.S. Preventive Services Task Force also issued new recommendations pertaining to the referral of women at risk for perinatal depression to counseling interventions such as cognitive behavioral or interpersonal therapy (USPSTF, 2019). While these recommendations are important steps to identifying women at risk for perinatal depression, no recommendations have been found in the

literature pertaining to the frequency of screening for other perinatal mood disorders.

Despite recommendations for perinatal depression screening, depression is grossly under-detected during routine perinatal care (Earls, 2010; Evans, Phillippi, & Gee, 2015). For example, Ko et al. (2012) found that pregnant women who met criteria for a major depressive episode in the past year were less likely to be diagnosed or treated for their depression than non-pregnant women. In a review of practices related to postpartum depression screening, less than half of all obstetricians, family physicians, and pediatricians surveyed ever inquired or screened for PPD, with pediatricians being the least likely group to do so (Evans, Phillippi, & Gee, 2015). Previous studies have shown that approximately 39% to 66% of women reported that depression was not discussed in health care after pregnancy despite women's acceptability to screening (Liu & Tronick, 2012; Walker, Murphey, & Xie, 2016). The perinatal period represents a time where women will have increased contact with health providers, and these actions represent missed opportunities to identify and refer women to mental health treatment (Kerker et al., 2016).

Several provider-focused barriers have been reported, namely time constraints for conducting screenings or assessments, low insurance reimbursements, as well as inadequate training, skill, or knowledge pertaining to PPD screening and treatment (Gjerdingen & Yawn, 2007). Likewise, inconsistencies in the frequency of depression screening and in the use of a standardized measure negatively impact identification and treatment. Changes in provider guidelines have contributed to these inconsistencies, as only in the last year did ACOG (2018) recommend universal screening for depression and anxiety at least once during the perinatal period. Finally, low rates in postpartum depression screening and diagnosis may also be due to provider's lack of familiarity with community mental health providers and lack of development of a clinic-based system to make and track referrals for treatment (Ko et al., 2012). Providers are

also less likely to screen women if there are no mental health resources in their communities that can address the needs of pregnant and postpartum women regardless of insurance coverage.

Perinatal Mental Health Disparities

Prevalence of perinatal mood disorders has been shown to be higher among women from racial/ethnic minority groups (Gavin et al., 2011; Melville et al., 2010), women of lower socioeconomic status (Mukherjee et al., 2017; Fellenzer & Cibula, 2014; Glazier et al., 2004), adolescent mothers (Fellenzer & Cibula, 2014; Martini et al., 2015), and women of older reproductive age (Ali et al., 2012; Gavin et al., 2011). Among U.S. born and immigrant Latinas, prevalence of perinatal depression has been estimated to range from 11% to 50% (Kuo et al., 2004; Lara et al., 2009). Women who fall in more than one of these demographic categories and who experience one or more of the risk factors for a psychiatric disorder (see page 50 above) were more likely to experience a mood disorder in the perinatal period.

Significant socioeconomic and racial-ethnic differences have been found in the initiation and continuation of perinatal mental health treatment in the U.S. Studies have shown that less than half of pregnant and postpartum women who met diagnostic criteria for depression received treatment (Ko et al., 2012). Among low-income women who experienced a new onset of depressive symptoms after delivery, African American and Latina women were less likely to initiate antidepressant or outpatient mental health treatment as compared to White women (Kozhimannil et al., 2011). African American and Latina postpartum women were also more likely to prefer counseling over medication, a finding consistent with previous mental health disparities studies (Vega et al., 2001; Gonzalez et al., 2010). Furthermore, the time frame from referral to treatment initiation was longer, and treatment continuing past four months occurred less frequently for African Americans and Latinas as compared to White women (Kozhimannil

et al., 2011). These findings indicated that a disproportionate number of lower-income, African American and Latina women who experienced postpartum depression symptoms did not receive needed services, providing evidence of racial/ethnic perinatal mental health disparities.

Qualitative studies have also addressed barriers to perinatal mental health treatment reported by lower income and ethnic-minority women, specifically regarding depression. Structural barriers in accessing mental health services, such as lack of insurance coverage and availability of mental health providers, are frequently mentioned. For lower-income women, the additional costs of transportation, childcare, and out of pocket payment for mental health services were additional barriers to care (O'Mahen & Flynn, 2008; Lara-Cinisomo et al., 2014). The quality of interactions with health providers also influenced decisions to initiate depression treatment. African American and Latina women were more likely to report that their lack of trust of health providers, influenced by past negative interactions and perceptions of health providers pushing medication over counseling, were significant barriers to help-seeking (Jesse, Dolbier, & Blanchard, 2009; Lara-Cinisomo et al., 2014). Other studies reported that cultural beliefs about mental health, stigma, lack of knowledge about perinatal mental health disorders, and limited access to psychoeducation contributed to racial-ethnic disparities in the attainment of appropriate mental health treatment (Lara-Cinisomo, Clark, & Wood, 2018).

Barriers to Treatment among Latinas. Cultural beliefs about mental health significantly impact help-seeking behaviors among Latinas. One pertinent cultural barrier frequently referenced is the belief among Latinas that depression is a normal reaction to stress and that symptoms will go away when stressors are managed (Lara-Cinisomo et al., 2014). Moreover, in describing symptoms of depression to health providers, Latinas were more likely to report somatic complaints rather than affective descriptions, as this was considered more culturally

acceptable. Given these beliefs and the concerns related to the impact of psychotropic medications on the developing fetus, Latina pregnant and postpartum women were less likely to consider medication as an effective treatment for depression (O'Mahen & Flynn, 2008; Lara-Cinisomo, Clark, & Wood, 2018).

Beliefs related to the expectations of motherhood also influence the identification of mental health symptoms and help-seeking behavior. The Latino cultural values of *familismo* (valuing family above all) and *Marianismo* (valuing highly feminine virtues of purity and moral strength), for example, dictate that a Latina mother must put the needs of her children and family above her own, and limit help-seeking for her own mental health needs, as it is considered a sign of weakness (Lara-Cinisomo, Clark, & Wood, 2018). Being a mother is a highly valued role in the Latino culture, but it comes with the expectation that one must be a "good" mother. Cultural messages such *"good mothers don't get depressed"* cast doubt of the existence of depression and discourages help-seeking if it means that a woman will not be seen by others as a 'good' mother (Abrams, Dornig, & Curran, 2009). For lower income and more so for undocumented Latinas, fears about having their child removed from their care also contributes to mothers minimizing or hiding their symptoms from health providers (Lara-Cinisomo et al., 2014; Abrams, Dornig, & Curran, 2009). Fears of the negative social connotations or stigma associated with depression or with receiving mental health treatment have been shown to be a significant barrier to help-seeking among Latinas.

Perinatal Mental Health Literacy Research

Compared to the national studies on mental health literacy worldwide, there is a dearth of literature evaluating perinatal mental health literacy. The first study that evaluated knowledge of perinatal depression found that among a random, Australian national sample (N=1,201),

approximately 44% of respondents indicated that depression was a health problem for women after childbirth and 90% recognized that postpartum depression required specialized treatment (Highet, Gemmill, & Milgrom, 2011). Over two-thirds of respondents agreed that mothers should be routinely assessed for postpartum depression. Still, this survey highlighted important gaps in Australian's knowledge regarding depression during pregnancy, with less than 4% identifying this as a health issue during pregnancy. Of concern was that over half of participants considered depression during pregnancy to be a 'normal part of having a baby' (Highet, Gemmill, & Milgrom, 2011). Similarly, participants had limited knowledge of perinatal anxiety, despite the high rate of comorbidity with depression in the perinatal period and the higher risk of women with anxiety to develop postpartum depression (Robertson et al., 2004).

Kingston et al. (2014) modified the population-based survey previously used in Australia to examine views of perinatal mental health in Canada. Among a random sample of rural and urban residents (N=1,207), over half of respondents knew that women with previous mental health histories were more likely to experience mental health difficulties in pregnancy, and that these difficulties might extend to the postpartum period (Kingston et al., 2014). While knowledge of postpartum mental health was high, respondents were less knowledgeable about the impacts of prenatal mental health disorders on women and their infants. Specifically, more than 40% of respondents indicated that they did not know or were unsure of the impacts (Kingston et al., 2014). Researchers also found that respondents who personally knew a woman who experienced postpartum depression or anxiety were more likely to have higher levels of perinatal mental health literacy as compared to those who did not know a woman who experienced these disorders.

The examination of perinatal mental health literacy is a novel and much needed research focus. Besides these two examples, no other population-based studies evaluating perinatal mental health literacy were found in the literature. More recent subsequent studies have used smaller, community-based samples to assess knowledge, attitudes, and help-seeking related to perinatal mental health. For example, Fonseca et. al (2017) conducted an online survey in Portugal to describe pregnant and postpartum women's perinatal depression literacy (N=194). Results indicated that women had moderate levels of depression literacy, with higher education and income associated with higher levels of literacy (Fonseca et al., 2017). The higher level of depression literacy included familiarity with depressive symptoms but not necessarily knowledge of potential treatments. Lower education and lower income were associated with lower levels of depression literacy, and women with less knowledge about depression were more likely to have difficulties identifying, describing, and managing negative emotions, affecting their awareness of depressive symptoms and recognition of need for help (Fonseca et al., 2017).

The only study found in the literature that was conducted in the U.S. evaluated perinatal mental health literacy among a small, perinatal adolescent Hispanic female sample (N=30). Recto & Champion (2017) modified O'Connor & Casey's (2015) Mental Health Literacy Scale and found that in this small sample, adolescents who reported that they experienced perinatal depression had significantly higher mental health literacy than those adolescents who did not have depression. Specifically, adolescents who reported perinatal depression were better able to identify risk factors, the types of treatments available, and self-help treatments.

Measurement of Perinatal Mental Health Literacy. Previous studies that examined perinatal mental health literacy referenced the Jorm et al. (1997) mental health literacy framework. While these studies supported the notion that perinatal mental health literacy

involved measuring knowledge, attitudes, and help-seeking behaviors related to perinatal mood disorders, they did not operationally define "perinatal mental health literacy" nor were the actual components of the construct specified. The lack of an operational definition, cited in previous critiques of health and mental health literacy, introduced substantial uncertainty with regard to the measurement of this construct. Moreover, several methodological limitations were found in each of the studies reviewed.

One common limitation across these studies was the lack of quantification on an individual level. For example, Highet, Gemmill, & Milgrom, (2011) and Kingston et al. (2014) developed surveys consisting of open-ended questions and Likert-scale statements with no numerical value assigned to the individual responses. Because scoring systems were not developed, researchers were unable to quantify a participant's perinatal mental health literacy at the level of the individual. Chi-square statistical tests were the only statistical analyses conducted and were used to test for differences in the number of participants in different demographic groups providing a given response to specific survey questions. Perhaps most importantly, none of the researchers standardized their surveys, which brought into question the validity of the results from these studies. Limitations with regard to sampling were also noted; in both studies the samples included subjects that were not most at risk for perinatal mental health disorders.

Fonseca et al. (2017) responded to these limitations by using validated scales to measure depression literacy and targeted the sampling to pregnant and postpartum women. Researchers used the Portuguese versions of the Depression Literacy Questionnaire (Griffiths et al., 2004), the EPDS (Cox et al., 1987), and the Difficulties in Emotion Regulation Scale (Coutinho et al., 2007) to compare women's levels of symptom recognition and treatment knowledge, to examine

correlations between depression literacy and sociodemographic factors, and to examine the effects of emotional competence on depression literacy (Fonseca et al., 2017). Compared to previous research, the authors used a validated instrument designed to measure depression literacy among Portuguese speakers. However, this scale was not developed to measure perinatal mental health literacy. Moreover, researchers only measured depression knowledge and did not measure attitudes or help-seeking. Sampling limitations in this study included the use of a small, self-selected, homogenous sample comprised of primarily married women with higher levels of education and income, which limited generalizability.

In the last study found, Recto & Champion (2017) examined depression literacy among a small, Hispanic American sample of pregnant and postpartum adolescent women recruited from high school parenting programs in the San Antonio, TX area. Researchers used the Mental Health Literacy Scale (MHLS) (O'Connor & Casey, 2015) to examine differences in depression literacy among participants that experienced depressive symptoms versus those that did not. This study was also primarily descriptive in nature, similar to previous studies, and used chi-square statistical analyses to assess group differences (Recto & Champion, 2017). Given the small sample size (N=30), it was difficult to identify significant differences in the group responses. Without the use of other validated measures, researchers were unable to identify clear differences in depression literacy.

The inclusion of the MHLS, a scale that has demonstrated good psychometric properties, was a strength of this study. Nonetheless, the MHLS has been validated with adult samples and has not yet been validated with an adolescent or a Hispanic sample. Also, the MHLS was specifically designed to measure mental health literacy and the conclusions generated from this study do not reflect the measurement of perinatal mental health literacy. Recto & Champion

(2017) made some item modifications to the MHLS for their Hispanic adolescent female sample; however, they did not validate this modified scale prior to use. Moreover, the modifications that were made to specific items were not cultural or developmental in nature, raising doubts regarding the accurate and valid measurement of depression literacy in Hispanic adolescents. Finally, in their use of a Hispanic sample researchers did not evaluate important demographic indicators such as nativity, income, or language, all that have been found to be risk factors for perinatal mood disorders among Latinas.

Summary

Pregnancy and the twelve months after childbirth represent a critical time for monitoring and enhancing women's physical health and emotional well-being. Women undergo many significant hormonal, physical, and emotional changes during this time while also having to attend to their baby's needs. Of concern to partners, family members, practitioners, and researchers are the psychological vulnerabilities that impact women and lead to the development of a psychiatric disorder. Depression is the most prevalent of all mood disorders impacting women during pregnancy and after childbirth and like other perinatal mood disorders, it is frequently underreported by women and undetected by health professionals (Ko et al., 2012; Earls, 2010). Given the many negative health and mental health outcomes associated with perinatal depression, it is imperative that researchers and practitioners continue to address gaps in the identification of and treatment for all perinatal mood disorders not just depression.

While extensive research has examined the prevalence of various perinatal mood disorders, less is known about what interventions improve barriers to care and improve mental health outcomes, particularly among lower-income women and women from racial/ethnic minority groups. The major contributing factors to the socioeconomic and racial/ethnic

disparities in perinatal mental health treatment are a lack of knowledge among new mothers and family members regarding 1) perinatal mood disorders, 2) providers who treat these disorders, 3) treatments available, and 4) negative attitudes towards treatment (Lara-Cinisomo, Clark, & Wood, 2018). Together these factors define a construct of perinatal mental health literacy. The research showing the association of these factors with disparities in the treatment of perinatal mental health disorders suggested that addressing perinatal mental health literacy among high risk mothers is one critical pathway for reducing disparities in the treatment of perinatal mental health.

The health and mental health literacy literature emphasized the importance of having a well-defined construct to guide research. The mental health literacy framework of Jorm et al. (1997) was used to define the construct of perinatal mental health literacy and the instrument for measuring this construct. In contrast to the numerous health and mental health literacy scales, there are no standardized measures of perinatal mental health literacy reported in the literature. The development and validation of the Perinatal Mental Health Literacy Scale (PMHLS), modeled after O'Connor & Casey's MHL scale, was a new contribution to the perinatal mental health literature. The validation of this instrument with a predominantly Hispanic, English and Spanish-speaking sample, tested for differences in the level of perinatal mental health literacy among Latinas and would identify specific areas of perinatal mental health literacy requiring intervention, which could eventually be used to reduce perinatal mental health disparities.

CHAPTER 3
METHODOLOGY

Perinatal mental health literacy can be a primary determinant of whether a woman reports and/or seeks help for mood disorder symptoms during pregnancy or after childbirth. Currently, no validated scale-based measure exists to gauge the level of a woman's perinatal mental health literacy. To fill this gap, a new scale was developed called the Perinatal Mental Health Literacy Scale (PMHLS). The first version of the scale was specifically designed for use in Latino populations. The PMHLS, a relatively brief 34-item questionnaire, attempted to quantify knowledge of and attitudes towards help-seeking for mood disorders commonly experienced by women during and after pregnancy. This new scale was designed for use by professionals seeking to determine the extent to which a person may require additional education regarding the risks of mood disorders during and after childbirth and thereby increase the likelihood that the person will recognize, report, and seek help for possible mood symptoms. Ultimately, the scale could be useful for research to determine gaps in perinatal mental health literacy among other high-risk groups of women of child-bearing age, their partners, and familial support systems.

Perinatal Mental Health Literacy Scale (PMHLS)

The goal of this study was to test the psychometric properties of the PMHLS using a large, linguistically diverse sample of Latina women of childbearing age residing in the U.S.-Mexico border region. The questions in the PMHLS followed a similar structure as those in the Mental Health Literacy Scale (MHLS), a standardized measure of mental health literacy in a scale-based format (O'Connor & Casey, 2015). The PMHLS measured perinatal mental health literacy, with specific measures of knowledge, self-help skills, and attitudes towards help-

seeking geared specifically towards the perinatal period.

The PMHLS consisted of 34 items and was developed for English and Spanish speaking Latinas. Items were developed for comprehension by persons with at least an 8th grade education. In addition, the Spanish translation of the PMHLS, developed by the researcher, was reviewed and revised by native speakers who assisted in word choice that best captured current language usage among Spanish speakers. Back translation was performed by a certified translator from the University of Texas at El Paso.

The following research questions were addressed in this study:

1) Which items in the PMHLS best measured the construct of perinatal mental health literacy?
    a. Hypothesis 1: Exploratory Factor Analysis (EFA) would demonstrate that the proposed items within each subscale correlated strongly with one another, indicating that the subscales were a measure of perinatal mental health literacy.
2) Was the PMHLS a reliable survey instrument in both languages?
    a. Hypothesis 2: Measures of internal consistency, namely Cronbach's Alpha and item total correlations, would demonstrate that individual items were related to their corresponding subscale and contributed to the measurement of perinatal mental health literacy.
3) Was the PMHLS a valid assessment of perinatal mental health literacy, as demonstrated by Confirmatory Factor Analysis (CFA), known-groups validity, and relationship to two other measures?
    a. Hypothesis 3: CFA, statistical analyses of known groups, convergent, and discriminant validity would demonstrate that the PMHLS was a valid measure of

perinatal mental health literacy for both English and Spanish speaking Latinas.

4) Did selected demographic variables predict perinatal mental health literacy in this study sample?

    a. Hypothesis 4: As compared to Latinas who did not advance beyond a high-school education (whether or not high school graduation was achieved), Latinas who completed post high-school education would demonstrate a higher level of perinatal mental health literacy as evidenced by higher scores on the PMHLS.

    b. Hypothesis 5: As compared to Latinas living at or below the federal poverty threshold, Latinas living above the poverty threshold would demonstrate a higher level of perinatal mental health literacy as evidenced by higher scores on the PMHLS.

3.1 RESEARCH DESIGN

The researcher followed best practices for psychometric scale development as defined in *Foundations of Psychological Testing* (Miller & Lovler, 2011) and followed all guidance given by the *Standards for Educational and Psychological Testing* (AERA, APA, & NCME, 2014). The following steps were used to conduct the psychometric study of the PMHLS:

1. Identification of the survey purpose and target audience
2. Review of the literature to identify gaps in knowledge
3. Development of the operational definitions of construct(s) being measured
4. Generation of the survey
5. Pretesting of the survey with focus groups
6. Conducting of the pilot study
7. Analyzing the pilot data to determine factor dimensionality, item correlations, and item

bias using Exploratory Factor Analysis

8. Conducting the validation study to determine internal consistency and fit of the hypothesized factor model using Confirmatory Factor Analysis
9. Analyzing data from the revised PMHLS and two additional scales to determine the following types of validity: evidence based on content, evidence based on relations with other variables, evidence based on internal structure, and known groups
10. Development of the guidelines for survey administration, scoring, and interpretation of scores
11. Publishing the findings
12. Continuing evaluation of the survey performance with different population samples

The completion of these steps occurred in the following phases:

Phase 1: Development of the PMHLS

Creating the PMHLS began by identifying the survey purpose, intended uses, and target audience. This involved creating an operational definition of the construct 'perinatal mental health' and content domains to assess. These domains provided the framework for generating an initial item pool. In the literature, perinatal mental health refers to a woman's mental health during pregnancy and up to one year after childbirth. Perinatal mood disorders such as depression, anxiety, trauma-related disorders, bipolar disorder, and postpartum psychosis are considered a significant complication of pregnancy and the postpartum period (O'Hara & Wisner, 2014). Thus, the purpose of this instrument was to measure knowledge of perinatal mood disorders and the target population was women of reproductive age. Furthermore, the Mental Health Literacy Scale (MHLS, O'Connor & Casey, 2015) used Jorm's definition of mental health literacy in its scale development, and for the PMHLS, this definition was also

applied to perinatal mental health literacy. As a result, the MHLS served as a useful template for the structure of the PMHLS. Finally, the researcher created a Spanish version of the PMHLS with guidance from a certified translator and native Spanish speakers to ensure fluidity and correct use of common language idioms.

Item Development. The construct of perinatal mental health literacy was operationally defined as consisting of six dimensions, or factors, similar to those of the MHLS but focused on the perinatal period (O'Connor & Casey, 2015):

Table 3.1 *Operational Definitions of Perinatal Mental Health Literacy Domains*

Dimension	Operational definition and rationale
recognition of disorders	ability to correctly identify features of the most common perinatal mood disorders
knowledge of how to seek information	knowledge of where to access information about perinatal mood disorders and capacity to do so
knowledge of risk factors and causes	knowledge of environmental, social, familial, or biological risk factors for perinatal mood disorders
knowledge of self-treatments	knowledge of typical treatments recommended by mental health professionals to improve well-being
knowledge of professional help available	knowledge of mental health professionals and the services they provide

Table 3.1 continued *Operational Definitions of Perinatal Mental Health Literacy Domains*

Dimension	Operational definition and rationale
attitudes	attitudes that impact the recognition of mood disorders and the willingness to engage in help-seeking behavior

Item revision through expert review. After the dimensions of perinatal mental health literacy were defined, the researcher reviewed the literature to generate a pool of items that best defined these domains. The researcher, a licensed mental health clinician with experience in treating perinatal mood disorders, reviewed possible items with her dissertation chair, a licensed clinical psychologist and experienced researcher. Individual items were reviewed for accuracy, grammar, appropriateness, bias, and readability. The researcher then translated the items into Spanish and obtained the expertise of two native Spanish speaking doctoral students and a certified translator. A five-point Likert response format (e.g. strongly disagree, disagree, not sure, agree, strongly agree) was used throughout the survey. Unlike the MHLS (O'Connor & Casey, 2015), the researcher chose to add a "Not Sure" response option to help increase response rate for all the items and decrease bias towards participants who were not sure how to best answer a question (Jung, von Sternberg, & Davis, 2016; Evans-Lacko et al., 2010). Table 3.2 below demonstrates the number of items created for each dimension.

Table 3.2 *Perinatal Mental Health Literacy Scale (PMHLS)/Initial Item Review*

Dimension	Initial Item Pool
Recognition of disorders	7
Knowledge of how to seek information	5
Knowledge of risk factors and causes	3
Knowledge of self-treatments	4
Knowledge of professional help available	4
Attitudes promoting help-seeking	11
Total	34

Once the initial draft of the scale was completed, the researcher obtained permission from the University of Texas at El Paso (UTEP) Institutional Review Board (IRB) to carry out the remaining steps of the study (IRB #1331666-1, I. Torres-Catanach, PI, C. Sobin, Faculty Mentor). Because the survey did not collect personally identifying information, this study qualified for exempt status by the IRB. Although signed informed consent forms were not required for this study, participants were offered a study information sheet to keep (see Appendix A). The final process in the initial development of the PMHLS involved pretesting the survey and conducting small focus groups with individuals from the target population, Latina women of childbearing age. Pretesting involved conducting individual interviews and for the focus group stage, three focus groups were conducted, with 3 to 4 participants in each group, to obtain more

detailed feedback regarding the question format, wording, and potential bias in both versions of the PMHLS. The duration of each focus group was less than 30 minutes. In both individual and group settings, Latina women were asked to complete the survey and discuss their experience completing it. The researcher then inquired about each person's comfort level in responding to the survey items, the cultural appropriateness of each item, their interest in completing the survey, and probed for difficulties with item interpretation or survey administration. Based on the unanimous recommendations given, changes were made to individual item wording, order presentation of the items, and instructions for survey completion.

Phase 2: Exploratory Study

The PMHLS and a brief acculturation survey (BASH) (Norris, Ford, & Bora, 1996; Mills, Malcarne, Fox, & Sadler, 2014), both anonymous surveys, were administered to a community and UTEP student sample. Recruitment in the community encompassed contacting agency directors and scheduling a face to face meeting to discuss the project and obtain permission to recruit at their sites. The community agencies that allowed for recruitment of women of childbearing age included: Maternidad La Luz (midwifery clinic); Breastfeeding Garden; Project Vida (a federally qualified community health center); Texas A&M De Mujer a Mujer classes; El Paso Health (health fairs and prenatal classes); Mexican Consulate; and Paso Del Norte Child Development Center (Incredible Years Parenting and Autism classes).

Non-identifiable demographic information such as age, gender, race/ethnicity, income, education, employment, pregnancy status, and past history of mental health treatment was also collected. A paper format of the surveys was provided to participants who gave verbal consent to participate. The researcher informed all participants that survey completion would take approximately ten to fifteen minutes of their time. Participants were given the option of

choosing the language they wanted to complete the survey in and were offered a copy of the study information sheet, brief educational information about perinatal mental health, and a list of community mental health resources. Lastly, a raffle of ten $100 gift cards (awarded at the end of the data collection period) was used as an incentive to increase participation in this study.

The target sample size for the Exploratory Study was N = 500; 250 surveys to be completed by English-speaking participants and 250 surveys to be completed by Spanish-speaking participants. Actual sample size in this exploratory phase was N = 269 surveys completed by English-speaking Latinas and N = 260 surveys completed by Spanish-speaking Latinas (total N = 529). Additional surveys completed by women from other racial/ethnic groups were collected but were not included in the statistical analyses.

The PMHLS, BASH, and the demographic items, which were included in one survey document, were self-administered with the researcher present to answer questions and ensure completion of all survey items. Participants completed the PMHLS and returned it to the researcher upon completion. The researcher and additional research assistants (when available) reviewed each returned survey for completion and confirmed collection of all survey documents.

Data from the Exploratory Study was analyzed separately by language in which survey was completed by Hispanic/Latina participants (details provided in Statistical Analyses section below). Results from the analysis of data from N = 529 Hispanic participants (269 English speaking, 260 Spanish speaking) were used to determine item characteristics. For example, analyses suggested that one or more items had low inter-item correlations, displayed ceiling or floor effects, or across the sample, did not elicit a range of responses. Items were dropped depending on the results of the initial analyses. Exploratory factor analysis (EFA) was then used to determine the factor structure that outlined the relationships between the identified survey

dimensions in the English and Spanish versions of the PMHLS. Further items were dropped during this process as well, resulting in a hypothesized factor model that best described the data.

Phase 3: Validation Study

The validation study population included a different participant sample of Latina women of child-bearing age from the community and from UTEP. The target sample size for this validation study was 250 participants, 125 who would complete all scales in English and 125 who would complete all scales in Spanish. In addition to completing the (revised) PMHLS, participants were asked to complete two additional previously standardized measures to determine the concurrent validity of the PMHLS: The General Help-Seeking Questionnaire (Wilson et al., 2005) and the Kessler Psychological Distress Scale (Kessler et al., 2002). The actual sample size in the validation phase was N = 142 surveys completed in English and N = 126 surveys completed in Spanish. As in the initial data collection period during the exploratory phase, additional surveys from women who were not Hispanic were also collected in the validation phase but were not included in the standardization of the PMHLS.

The same data collection methods in the Validation phase were used as described above for the Exploratory phase. When each participant completed the survey instruments, participants were given educational information on perinatal mental health and current contact information for local services providers (e.g. crisis hotline, El Paso Behavioral Health System, Postpartum Support International).

Threats to internal validity were closely considered to ensure confidence in the interpretation of the results. For this scale, internal validity referred to the extent to which results obtained from the PMHLS were an accurate representation of an individual's level of perinatal

mental health literacy. Threats to internal validity can occur before and during survey completion, such as how the researcher approached individuals to participate in the study and how participants responded to the survey as it was being completed. Additional threats to internal validity included the researcher's responses to individual questions a participant asked about an item, participant's interest in completing the survey when pressed for time, distractions in the environment, and possible inconsistencies in providing a quiet, private space to complete the survey. For this research project, the researcher made a concerted effort to standardize the conditions for recruitment in both campus and community settings and as well as in the verbal instructions and responses given to participants.

3.2 SETTING, POPULATION, AND SAMPLE

Participant recruitment for both the Exploratory and Validation phase took place on the UTEP campus and in public community settings within El Paso County. Within the community, the researcher specifically targeted pediatric and obstetric medical practices and community health agencies/events for recruitment. Actual recruitment primarily came from community health fairs, clinics, and parenting and prenatal classes that were held throughout El Paso County from May to September 2019. Within the UTEP campus, the researcher recruited female students of childbearing age from various settings such as public spaces on or near campus and from different classrooms. For example, the researcher contacted UTEP faculty to ask if this study could be offered to female students in their classes. The researcher also contacted various community agencies and medical providers to set up a time to discuss the research project and obtain permission to recruit from their clinics or from health fair events they were hosting. Recruitment from both the university and community settings was sought out to ensure a demographically diverse participant pool.

The target population for the standardization of the PMHLS in English and Spanish was Latinas of childbearing age, 18 to 45 years old. A central goal of this research study was to test the psychometric properties of the Spanish PMHLS, as there is a gap in the literature with regards to studies of standardized scales for use with Spanish-speaking samples. Validating both the English and Spanish language versions of the PMHLS was also necessary to achieve adequate representation of monolingual Spanish and bilingual speakers that live along the U.S.-Mexico border region. As such, participants completed the Brief Acculturation Scale for Hispanics (BASH) (Norris, Ford, & Bora, 1996; Mills, Malcarne, Fox, & Sadler, 2014) to identify language preferences among participants in this study. The target sample size for the Exploratory Study was 500 participants, while in the Validation Study the target was another 250 participants. Significant outreach across various community programs and on campus was done to meet the large sample sizes required for EFA and CFA.

SAMPLING PROCEDURES

The exploratory and validation components of this study used non-probability sampling procedures, which allowed for convenient, purposive, and snowball participant samples. Since the purpose of this research endeavor was to test the reliability and validity of a new scale, non-probability sampling methods were preferred given the ability to recruit a large number of participants in a short amount of time. In addition, the target population, consisting of Latina women of reproductive age, was relatively easy to access in university, community, and health settings in the El Paso border region where the Hispanic population is estimated to be 83% (Census, 2018). Participant sampling from the university was approximately 55-60%, with the remaining participants coming from the community locations previously referenced.

While there are great benefits to having easy access to participants using non-probability sampling methods, there are potential drawbacks as well. First, when participants are not chosen at random, the findings from any study are not considered generalizable to the greater population at large. Therefore, results of this study will not be generalizable to other populations, including Hispanic populations across other sections of the country. Secondly, use of non-probability sampling methods introduced the potential of bias in the selection of the participants by the researcher. For example, the researcher may have purposely selected individuals that were more convenient to approach, or whom the researcher perceived would be more open to completing the survey instruments. Finally, the concept of social bias was also introduced when using these sampling methods, as participants may have responded to the survey items in ways they perceive are socially desirable or preferred by the researcher. To minimize this bias, the researcher approached potential participants by using a similar greeting in both languages, described the purpose of the study using a standardized format, and emphasized that survey responses were anonymous and confidential.

3.3 INSTRUMENTATION

In the Exploratory Study phase, participants completed a paper version of the PMHLS in either English or Spanish, consisting of thirty-four items that measured knowledge of, attitudes, and help-seeking behaviors towards perinatal mental health (see Appendix B & C). The PMHLS also included brief demographic survey questions that queried age, gender, nativity, race/ethnicity, type of ethnicity, income level, education level, employment status, pregnancy status, number of children a participant has if any, and if there was a history of mental health treatment for themselves or a family member (see Appendix D). Also, participants were asked to complete the four-item BASH to identify acculturation based on their language preferences.

Scoring ranged from 4-20, with a higher score indicative of a higher level of acculturation (see Appendix E) (Norris, Ford, & Bora, 1996; Mills, Malcarne, Fox, & Sadler, 2014).

For the Validation Study, a different group of participants completed the revised PMHLS and the BASH. Changes to the initial 34-item scale were based on EFA conducted with the data collected in the Exploratory phase and resulted in a decrease in the same type and number of items for the English and Spanish PMHLS. The revised PMHLS, which was used in the validation phase, consisted of 27 items in both scales. To assess convergent and discriminant validity, participants were asked to complete two additional scales that measured help-seeking behaviors and general psychological distress. It was noted that there was a limited number of scales available in the literature that have been standardized with Latino populations, in English or Spanish, that could be used for assessing convergent or discriminant validity of the PMHLS.

General Help-Seeking Questionnaire (GHSQ). Convergent validity was assessed using the GHSQ, a measure of intention to seek help from different sources (Wilson et al., 2005). This instrument consisted of 2 questions that asked participants to rate their intentions to seek help from ten targeted sources. Responses to those choices were rated on a 5-point Likert-type scale (1 = Extremely Unlikely to 5 = Extremely Likely). The original GHSQ used a 7-point Likert scale; this response format was later modified to a 5-point scale (Wilson et al., 2005). The first question asked participants *"If you were having a personal or emotional problem, how likely is it that you would seek help from the following people?"* and was followed by the ten possible sources of support (Wilson et al., 2005). The second question asked participants *"If you were experiencing suicidal thoughts, how likely is it that you would seek help from the following people?"* and was followed by the same source options. The developers of the GHSQ noted that targeted sources could be modified according to the purpose of the study and sample

characteristics. Thus, potential sources of support frequently referenced by Hispanic populations, such as extended family members and religious sources of support, were included. Scores on the two items were summed, with higher scores indicating a higher intention to seek help. The original GHSQ was significantly correlated with actual help-seeking behavior, demonstrated good test-retest reliability (r = .92) and yielded a Cronbach's alpha of α = .85 (Wilson et al., 2005). To date, this scale has not been validated with a U.S. Latino sample. Therefore, the researcher translated this instrument and obtained back translation services from a certified translator to capture language use among Spanish speakers (see Appendix F). Validation of the GHSQ using the Latino samples collected for this study will be completed at a later time.

Kessler Psychological Distress Scale 10 (K10). Discriminant validity was assessed using the K10, a measure of general psychological distress (Kessler et al., 2002). This scale was selected to test discriminant validity of the PMHLS to ensure that responses on the PMHLS were not simply measuring current psychological distress as opposed to perinatal mental health literacy. This instrument consisted of ten items that asked individuals to rate their level of distress in the last thirty days. An example of an item was *"during the last month, how often did you feel tired out for no good reason?"* (Kessler et al., 2002). Participants indicated their level of agreement to items on a 5-point Likert scale ranging from 1 = none of the time to 5 = all of the time, with higher scores indicative of greater levels of distress. Previous studies have shown that this screening tool differentiated clinical from non-clinical samples. The K10 is frequently used by the U.S. National Center for Health Statistics and the World Health Organization, and has been translated into multiple languages, including Spanish (McVeigh et al., 2006). Cronbach's alpha analysis measure of internal consistency for the English version of the K10 was α = .93 (Kessler et al., 2002). However, validation measures of the Spanish version of the K10 have not

been found in the literature (see Appendix G).

Known-groups validity was assessed by comparing the PMHLS scores of women who reported a history of mental health treatment for themselves or their family members to those who did not. An independent samples t-test was used to determine known-groups validity among participants who completed the PMHLS in English and Spanish during both study phases.

PROCEDURE FOR DATA COLLECTION

Formal recruitment for this research study began in May 2019. Emails were sent out to various UTEP professors requesting permission to recruit students for the Exploratory and the Validation Study. Recruitment for the Exploratory Study took place from May to September 2019; recruitment for the Validation Study took place from October to December 2019. To obtain a more demographically diverse participant sample, the researcher also approached English and Spanish-speaking Latinas of childbearing age in various community agencies and public spaces across the county for recruitment in both study components. When given approval by community agencies, pediatric or obstetric practices, the researcher approached potential participants in the waiting area and offer them a recruitment flyer. To minimize disturbances in medical settings, the researcher offered to meet with individuals who were interested in participating after their scheduled medical or service appointment. Recruitment in the community was more heavily concentrated in multiple health fair events that took place in various public and school settings, as well as in parenting or prenatal classes offered to smaller groups of women. In either classroom or public settings, the researcher described the purpose of the study using a standardized format and emphasized that survey responses were anonymous and confidential. The researcher collected all paper surveys as soon as they are completed.

Data Cleaning. Data was carefully monitored during the collection process to ensure the data quality and completion of all items by all participants. Data was entered as they were collected so the researcher could run preliminary analyses to determine trends in the data. For example, early results were assessed for patterns of missing data, presence of outliers, normality, and multicollinearity. Furthermore, survey results were not entered for analysis when the completion rate for any given survey fell below 80%. (For example, for the Exploratory Study which used the 34-item PMHLS, survey results were entered only if a participant completed at least 27 items.) In addition, survey results were not considered for analysis when the participant gave the same response to all items. The demographic makeup of the total sample of Latinas was continuously monitored to ensure participation across various age, language, education, and income groups and to obtain a balance between university and community sample representation.

Statistical Analysis. The Statistical Package for the Social Sciences (IBM/SPSS Version 24) was used to analyze data from the Validation Study, while the SPSS Amos software program was used in the Validation Study. Initial descriptive analyses were conducted to evaluate data for evidence of skewness and kurtosis. In a perfect normal distribution, skewness and kurtosis scores would be zero; however, scores ranging from -3 to 3 were considered reasonable given the application of this scale. A correlation matrix was created for each scale to determine the relationships between the dimensions prior to the implementation of exploratory factor analysis. Cronbach's alpha values and item-total correlations were then used to estimate the internal consistency and reliability of the English and Spanish versions of the PMHLS.

PROCEDURES FOR DATA ANALYSIS

PMHLS Exploratory Study. The purpose of the exploratory study was to determine the factorability of the data by testing the underlying factor structure of the initial 34-item PMHLS. After surveys were collected, all data was entered into SPSS for data screening and initial statistical analyses. The researcher reviewed the data for evidence of skewness and kurtosis; a Bartlett's test of Sphericity and Kaiser-Meyer-Olkin (KMO) value were then obtained to determine whether the data were normally distributed and thus acceptable for conducting a factor analysis. Since this was a new scale with unknown dimensions, Exploratory Factor Analysis (EFA) was performed to identify correlations and shared variance among the dimensions, or factors, of the PMHLS. Based on best practices in scale development, EFA was used first instead of a Confirmatory Factor Analysis (CFA) due to the researcher having uncertainty about the factors that define the perinatal mental health literacy construct (Carpenter, 2018). Results from this initial statistical analysis provided guidance regarding the need to delete items that did not fit well with a specific dimension and identified a hypothesized factor model for the PMHLS.

PMHLS Validation Study. The purpose of the Validation Study was to confirm the factor structure for both versions of the PMHLS found in the EFA that was done in the Exploratory Study. To do this, the researcher conducted a CFA in this second phase of the study with a different participant sample. In addition, the researcher aimed to present evidence of convergent and discriminant validity via correlational analyses surrounding the PMHLS, the GHSQ, and the K10. Internal consistency, via measures of Cronbach's Alpha and item-total correlations, provided evidence for the reliability of the revised English and Spanish PMHLS.

PROTECTION OF RESEARCH PARTICIPANTS

The Exploratory and Validation studies of the PMHLS consisted of female participants completing anonymous survey documents. Although participants did not have to sign a consent form, the researcher provided each participant with a summary of the study, a brief education on perinatal mental health, and a list of community mental health resources. The researcher offered to read the consent form in either language if an individual preferred. Once the researcher obtained a participant's verbal consent to proceed, the participant was given the survey instruments to complete in their preferred language.

CHAPTER 4
RESULTS

The primary purpose of this study was to standardize a new scale, the Perinatal Mental Health Literacy Scale (PMHLS), using large, linguistically diverse samples of Hispanic women of childbearing age residing in the U.S.-Mexico border region. The tests of the psychometric properties of the English and Spanish versions of the PMHLS given below were conducted in two phases using different samples of participants. The exploratory factor analysis included data from 269 English-completers and 260 Spanish-completers. The confirmatory factor analysis included data from 142 English-completers and 126 Spanish-completers. The results are reported separately for each phase of the analyses (exploratory and confirmatory) and within each, the results from the English-completers and Spanish-completers are reported and compared. Each section begins with a review of the demographic characteristics of each sample. Next, each step in the exploratory and confirmatory analysis is explained. The steps for the Exploratory Factor Analysis (EFA) follow those suggested by Williams, Onsman, & Brown (2010). Reliability statistics were then used to determine whether the resulting factor model was a reliable measure of perinatal mental health literacy. The steps for the Confirmatory Factor Analysis (CFA) follow those suggested by Shek and Yu (2014).

Overview of Results

EFA results were relatively consistent across the English and Spanish scale versions. A six-factor solution was found for each instrument, and the individual items and factors within the scales were aligned by dropping seven items from the original PMHLS. The hypothesized 6-factor model determined by the EFAs was then tested with a new sample using CFA. In

combination with additional validation tests, the CFAs suggested that the proposed 6-factor model best defined the perinatal mental health literacy construct, and that a 25-item PMHLS was a valid measure of perinatal mental health literacy among English and Spanish-speaking Latinas. Lastly, in exploratory analyses, regression models were calculated to test whether education, income, and/or history of mental health treatment predicted level of perinatal mental health literacy in these samples of Hispanic women.

Demographics

Table 4.1 below presents a demographic overview of the sample collected for the EFA phase of this study. Recruitment was limited to females of childbearing age, who were between the ages of 18 to 45 years old and lived in the El Paso border region. Besides completion of the initial PMHLS, participants responded to ten questions about age, gender, race/ethnicity, place of birth, income, education, employment, pregnancy status, number of children, and history of obtaining mental health services for self or a family member. Participants also completed the 4-item BASH, which measured their level of acculturation based on the language they most think in, speak at home, speak with friends, and use regularly. This measure was added as it was anticipated that the majority of the sample would be of Hispanic origin and are at some level familiar with and speak Spanish. Recruitment occurred among women whose ethnic origin was not pre-screened. For this reason, the final collected data set of N=573 included 44 women not of Hispanic origin who did not meet the a priori inclusion criteria and were not included in the data analyses. Demographic data are shown for the N=529 women who met criteria for ethnic origin (Hispanic). Data from women who identified as belonging to other racial/ethnic groups may be included in future analyses.

Table 4.1 *Demographic Characteristics of Hispanic Sample (N=529)*

Characteristic	English (N=269)		Spanish (N=260)	
	#	%	#	%
Gender				
Male	0	0	0	0
Female	269	100	260	100
Other	0	0	0	0
Age				
18-24	137	51	121	46
25-31	61	22	60	23
32-38	46	17	40	15
39-45	24	9	40	15
Hispanic type				
Mexican	246	91	250	96
Puerto Rican	1	.4	1	.4
Cuban	2	.7	0	0
Salvadoran	3	1.1	1	.4
Honduran	1	.4	0	0
Guatemalan	1	.4	0	0
Other Hispanic group	15	5.6	8	3.1
Born in the U.S.				
Yes	240	89	121	46
No	28	10	139	53
Annual Income				
Less than $15,000	166	62	179	69
$15,000-$29,999	49	18	47	18
$30,000-$49,999	33	12	24	9
$50,000 and above	18	7	6	2

Table 4.1 continued *Demographic Characteristics of Hispanic Sample (N=529)*

Characteristic	English (N=269)		Spanish (N=260)	
	#	%	#	%
Education				
Less than high school	7	3	46	18
HS diploma/GED	38	14	54	21
Some college courses	109	40	102	39
Associates degree	56	21	26	10
Bachelor's degree	45	17	30	11
Master's degree	14	5	3	1
Employment Status				
Unemployed, looking	56	21	61	23
Not looking for work	73	27	79	30
Part-time	90	34	81	31
Full-time	49	18	36	14
Pregnancy status				
Yes	10	4	29	11
No	258	96	229	88
Parent				
Yes	130	48	131	50
No	139	52	127	49
Mental Health History				
Yes	143	53	84	32
No	126	47	174	67

Table 4.1 continued *Demographic Characteristics of Hispanic Sample (N=529)*

Characteristic	English (N=269)		Spanish (N=260)	
	#	%	#	%
BASH Summary				
Only Spanish	8	3	115	44
More Spanish	22	8	59	23
Both	80	30	59	23
More English	90	33	20	8
Only English	69	26	7	2

In review of these demographic data, several similarities were evident between the groups of Hispanic women who completed the scale in English and those who completed it in Spanish. Over 90% of respondents in both groups identified as primarily of Mexican descent, which is consistent with the racial/ethnic population distribution in El Paso County (82%, Census, 2018). In comparing the sample of English and Spanish-completers, at least two-thirds of the participants in each group were women between the ages of 18-24 and 25-31. The reported annual income was also very similar, with at least 80% of women in each group reporting incomes of less than $30,000 a year. Lastly, both groups reported similar employment status, with approximately half of each group reporting that they were currently employed.

Differences between English and Spanish-completers were also evident. With regards to education levels, 17% of English-completers had a high school education or less, as compared to 39% of Spanish-completers. Both groups, though, reported similar college course completion percentages of about 40%. The attainment of a college degree (Associate, Bachelor, Master's or

higher) however, was more frequent among Hispanic women who completed the PMHLS in English, with 43% of this group attaining a college degree as compared to 22% of women who completed the scale in Spanish. Another noticeable difference was with regards to nativity; 89% of English completers reported that they were born in the U.S., as compared to 46% of Spanish completers.

The last group of demographic questions focused on pregnancy and parenting status, plus an inquiry into past history of receiving some sort of mental health services (e.g. counseling or psychotropic medications) for themselves or a family member. Most of the participants were not pregnant at time of survey completion (4% of English completers and 11% Spanish completers). Furthermore, approximately half of the participants in each group reported that they were a parent to at least one child. Lastly, a considerable difference between English and Spanish completers was noted in the percentage of women who reported that they or their family members previously received mental health services (53% among English completers and 32% among Spanish completers).

The last group of demographic questions pertained to responses to the Bilingual Acculturation Scale for Hispanics (BASH) (Mills et al., 2014). This 4-item scale was designed to measure acculturation among Hispanic populations. It queries language preference in different settings including everyday life, thinking processes, social interactions with family members at home, and social interactions with friends. Overall, among English-completers, 59% reported that they preferred to communicate in only or mostly English, while 67% of Spanish-completers preferred to communicate in only or mostly Spanish. The groups were also similar in the percentages of women who use Spanish and English interchangeably (30% of English-completers and 23% of Spanish-completers). This brief measure suggested a similar level of

acculturation among women English and Spanish-completers.

4.1 Research Question 1: Which items in the PMHLS best measured the construct of perinatal mental health literacy?

When determining the psychometric properties of a new scale, particularly for a scale that is attempting to measure a construct that cannot be measured directly, researchers frequently use Exploratory Factor Analysis (EFA). EFA is a statistical procedure that reduces a large number of variables into smaller sets of correlated variables, referred to as factors, which are thought to measure different aspects of the latent construct (Field, 2013; Williams, Onsman, & Brown, 2010), in this case, perinatal mental health literacy. The reduction of the variables into factors establishes the magnitude of relationships between the variables that can be measured, and the factors that are thought to best represent those variables. Results from an EFA procedure can serve to provide evidence of construct validity of a new scale (Williams, Onsman, & Brown, 2010). Finally, EFA is exploratory in nature and commonly used when the researcher has no expectations of which or how many factors will best represent the construct being measured. Thus, EFA is best suited for evaluation of a scale not previously tested, or when using with a previously untested population. While some of the structure of the PMHLS was modeled after the MHLS developed by O'Connor & Casey (2015) using Jorm et al.'s (1997) mental health literacy framework, the items in the scale are referencing content related to perinatal mental health which has not been previously examined in the mental health literacy research.

The application of EFA to the 34-item PMHLS in English and Spanish will be described below. The approach follows Williams, Onsman, & Brown's (2010) five-step EFA protocol. At each step, a sequential and linear process was followed and decisions regarding item deletions, factor extraction, rotation method, and factor labeling will be explained. Further, EFA was re-

run after each item was removed to assess the impact on the factor structure.

Application of EFA to the English-language dataset (N=269)

The application of EFA to the dataset from Hispanic women who completed the survey in English (N=269) will be described first, followed by the application of EFA to the dataset from Hispanic women who completed the survey in Spanish (N=260).

EFA Step 1: Examining the suitability of data for factor analysis (English) To determine if the data were suitable for conducting EFA, sample size, sample to variable ratio, the factorability of the correlation matrix, and sample size adequacy were considered. The sample of Hispanic female participants who completed the PMHLS in English for EFA was N=269. The frequently referenced sample size recommendations for factor analysis given by Comrey & Lee (2013) were 200 (considered "fair") and 300 (considered "good"). The sample size for the English-completers fell between these two categories, indicating this sample was adequate for conducting factor analysis. Best practices referenced in the literature regarding how many participants were required for each variable was approximately 8:1 (Williams, Onsman, & Brown, 2010; Hogarty et al., 2005). The PMHLS had 34 items requiring a sample size of approximately 272, which was met by the actual sample size of 269 participants.

An examination of the correlation matrix provides researchers the ability to examine the relationships between individual variables. When measuring psychological constructs, researchers often expect correlations between variables. A high number of correlations between variables observed in the matrix, preferably with correlations above .30, indicate that many variables are related to one another. The high number of correlations may also indicate that some variables are more related to one another than with other variables, which may be an

indication of items loading on a particular factor, suggesting that the data are appropriate for factor analysis. It is at this step that a researcher can first determine removal of items from a scale if the correlations between selected variables are weak. Any decision to remove a variable, however, must be grounded in sound judgment and in the theoretical framework of the construct being measured (Williams, Onsman, & Brown, 2010).

Table 4.2 provides an overview of the 34 items in the PMHLS and the number of correlations each item had with other variables in the scale. Upon close examination of the correlation matrix for the 34 items, one variable had no correlations with any other variable and two other variables had one weak correlation with another item (shown in bold and italics).

Table 4.2 *Correlation Matrix of 34-item PMHLS among English-Language Sample (N=269)*

Item	# of Correlations	Range
MHD is a sign of personal weakness	3	.368-.516
MHD are not a real medical illness	3	.368-.412
Women can't manage own problems	3	.400-.575
Women could snap out of it if they wanted	3	.412-.575
Women are danger to themselves and baby	**0**	n/a
If I had a MHD I would tell someone	5	.360-.709
If I had a MHD I would seek professional help	5	.314-.709
Treatment for MHD would be effective	4	.320-.480
Someone I know with a MHD would tell others	5	.313-.763
Someone I know would seek professional help	4	.398-.763
People believe treatment would be effective	5	.314-.458
If person hurts self, it's ok to call 911	**1**	.320
If not life threatening, it's ok to tell family	**1**	.313
I search for MH info online	3	.440-.655
I search for MH from doctors/professionals	4	.463-.655

Table 4.2 continued *Correlation Matrix of 34-item PMHLS among English-Language Sample (N=269)*

Item	# of Correlations	Range
I know where to search for MH info in community	3	.315-.479
I attend appointments with MH providers	4	.408-.549
I search for MH info from partner, friends, family	4	.315-.547
Past MH predicts A or D in pregnancy/postpartum	3	.319-.612
Stressful life events impact pregnancy/postpartum	2	.612-.621
Little social support predicts A or D in preg/post	3	.320-.621
She has a condition called anxiety disorder	5	.341-.534
She has a condition called bipolar disorder	5	.338-.534
She has a condition called traumatic stressor	6	.325-.499
She has a condition called major depression	6	.353-.512
She has a condition called obsessive-compulsive	6	.351-.512
She has a condition called brief psychotic disorder	5	.325-.470
She has postpartum baby blues	7	.319-.469
Interpersonal therapy would be helpful	1	.637
Cognitive behavioral therapy would be helpful	1	.637
Include safe forms of exercise in daily routine	3	.512-.716
Talk with partner/friends about her feelings	3	.470-.806
Avoid situations that make her anxious/depressed	3	.470-.512
Spend time outside the home with partner/friends	3	.498-.806

In review of the items with zero or weak correlations, three items that met these conditions were deleted. In the case of this particular instrument, in fact, references in the perinatal mental health literature for items with no or weak correlations were not found. (The items had been originally included for consistency with Jorm's (1997) and O'Connor's (2015) research; this will be discussed in detail in the Discussion below). Subsequent EFA analyses

excluded the three noted items, resulting in a scale with 31 items.

The last step in determining if the data were suitable for conducting EFA was to examine the adequacy of the sample. Two tests frequently recommended to test this adequacy are the Kaiser-Meyer-Olkin Measure (KMO) (Kaiser, 1974) and Bartlett's Test of Sphericity (Bartlett, 1950). The KMO index, ranging from 0 to 1, should be at least 0.50 and Bartlett's test should be significant ($p<.05$) for the data to be considered suitable for factor analysis (Williams, Onsman, & Brown, 2010). The KMO index for the English PMHLS dataset of 31 items (N=269) was .769; results from Bartlett's test were significant at $p<.000$, together indicating that these data were suitable for EFA.

EFA Step 2: Extracting scale factors (English) The primary goal of factor extraction is to identify clusters of related items, such that items that are measuring a specific aspect of the construct will load heavily onto a specific factor. While several factor extraction methods are referenced in the literature, Principal Axis Factoring (PAF) was chosen to extract factors from the PMHLS. PAF is often used in social sciences research as it provides a thorough representation of observed correlations between variables and latent factors. PAF is also recommended when the data are not normally distributed. Tests of skewness and kurtosis of the 31-item scale (N=269) identified eight items that were above recommended skewness (-2 to 2) and kurtosis (-3 to 3) thresholds (Field, 2013). Table 4.3 demonstrates the items that exceeded these thresholds.

Table 4.3 Measures of Skewness and Kurtosis of Eight Items in the PMHLS Dataset (N = 269)

Item	Skewness	Kurtosis
MHD a sign of personal weakness	-2.198	5.458
MHD not a real medical illness	-2.616	8.809
Women can't manage own problems	-3.143	11.500
If person hurts self its ok to call 911 to get help	-2.008	4.853
I attend appointments with MH providers to get info	2.049	3.191
Include safe forms of exercise in daily routine	-2.008	5.740
Talk with partner, family, or friends about her feelings	-2.338	7.876
Spend time outside the home with partner or friends	-1.943	6.186

EFA Step 3: Examine criteria to assist in determining factor extraction (English)

Several criteria are available to researchers to assist in reducing a large number of items into factors, with no one criteria assumed to determine factor extraction (Williams, Onsman, & Brown, 2010). Furthermore, it is suggested that multiple approaches for factor extraction should be applied to the data, as this process is considered the "gold standard" in the psychometric literature. The most common approaches used for factor extraction include Kaiser's criteria (eigenvalue > 1 rule) (Kaiser, 1960); the Scree test (Cattell, 1966); and parallel analysis (Horn, 1965). These three approaches were used in the EFA.

Factor extraction using PAF provided two sets of results. The first was a table of communalities. These correlations indicated the shared variance explained by the factors and demonstrated that a large amount of the variance had been extracted by the factor solution. Correlations after factor extraction ranged from .317-.825. Correlations below .3 would have

signaled that an item did not share much variance with another item and could be removed from further analyses. However, all 31 items in the PMHLS English-language dataset (N=269) met this criterion and were retained for the next step in factor extraction.

Kaiser's criterion indicated that all factors with eigenvalues greater than 1 should be retained, as it is believed that factors meeting this criterion represent a substantial amount of variation in the model (Field, 2013). Thus, factor extraction using PAF was conducted by selecting all factors that had eigenvalues greater than 1. Table 4.4 provides a summary of the eigenvalues, percent of variance, and cumulative percent of variance for the first ten of 31 items in the PMHLS English-language dataset:

Table 4.4 *Kaiser's Criteria for PMHLS English-Language Dataset (N=269)*

Factor	Eigenvalue	% of Variance	Cumulative %
1	5.457	17.604	17.604
2	3.413	11.009	28.613
3	2.699	8.706	37.319
4	2.571	8.293	45.612
5	2.124	6.852	52.464
6	1.516	4.891	57.355
7	1.298	4.186	61.541
8	**1.049**	3.384	**64.925**
9	.964	3.110	68.034
10	.911	2.939	70.974

Based on these results, eight factors had eigenvalues greater than 1.0 and explained approximately 65% of the total variance. Therefore, Kaiser's criterion suggested that eight

factors should be extracted. Given that Kaiser's criterion has been shown to overestimate the number of factors to retain (Field, 2013), comparisons with results from the Scree plot (Figure 4.1) and parallel analysis were warranted.

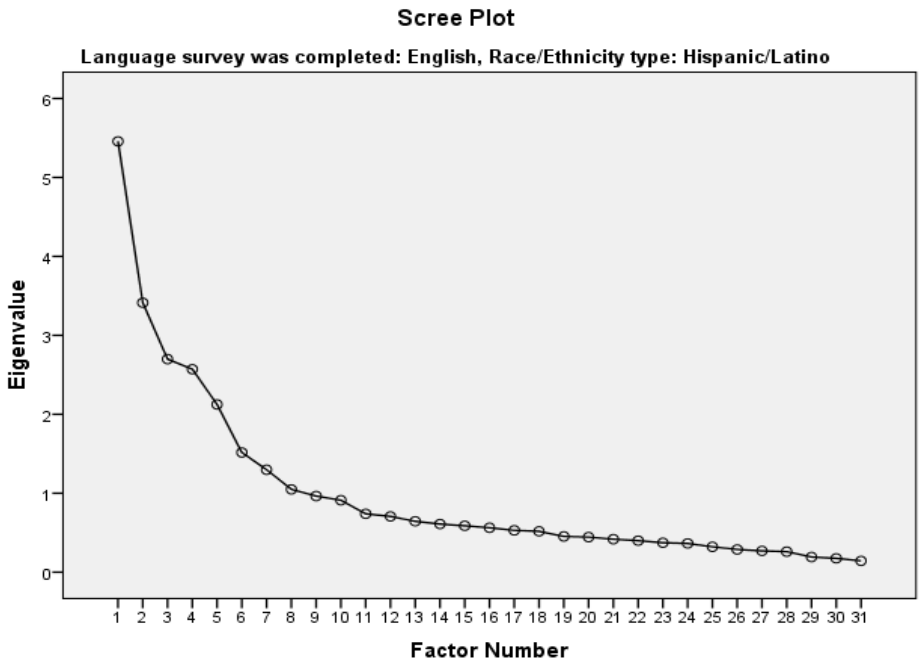

Figure 4.1 *Scree Plot of PMHLS English-Language Dataset (N=269)*

A visual inspection of the Scree plot suggested that if the point of inflection was at Factor 7, then six factors should be retained. In view of a discrepancy with regards to what number of factors to extract using the two methods above, parallel analysis was also conducted.

Parallel analysis is a factor extraction technique whereby actual eigenvalues are compared with random order eigenvalues and factors are retained when actual eigenvalues surpass the random order eigenvalues (Williams, Osman, & Brown, 2010). Table 4.5 shows results from the parallel analysis that was conducted using SPSS with the 31-item PMHLS English-language dataset.

Table 4.5 *Parallel Analysis of 31-item PMHLS (N=269)*

```
Run MATRIX procedure:

PARALLEL ANALYSIS:

Principal Components

Specifications for this Run:
Ncases    269
Nvars      31
Ndatsets  100
Percent    95

Random Data Eigenvalues
         Root        Means     Prcntyle
     1.000000     1.693259     1.772418
     2.000000     1.603492     1.686244
     3.000000     1.527521     1.581535
     4.000000     1.463742     1.516231
     5.000000     1.408842     1.459988
     6.000000     1.355178     1.394841
     7.000000     1.306201     1.346063
     8.000000     1.261696     1.299057
     9.000000     1.220530     1.254935
    10.000000     1.176855     1.216448
    11.000000     1.142456     1.178139
    12.000000     1.107367     1.137838
    13.000000     1.068327     1.101063
    14.000000     1.031741     1.064335
    15.000000      .997107     1.040903
    16.000000      .963467      .993827
    17.000000      .933484      .970755
    18.000000      .899454      .925188
    19.000000      .869063      .906572
    20.000000      .839864      .866994
    21.000000      .806518      .833706
    22.000000      .774333      .800311
    23.000000      .745498      .773037
    24.000000      .715077      .741736
    25.000000      .683361      .710412
    26.000000      .650347      .676913
    27.000000      .618827      .652204
    28.000000      .588591      .613317
    29.000000      .555723      .585760
    30.000000      .517641      .549836
    31.000000      .474438      .512605
```

In comparing the actual eigenvalues that were obtained using Kaiser's criteria (Table 4.4) with the random order eigenvalues generated by parallel analysis (Table 4.5), the point at which

actual eigenvalues surpassed random order eigenvalues was at Factor 6 (1.516, 1.394 respectively). Results from the parallel analysis supported the findings from the Scree plot, indicating that six factors should be retained. A six-factor model was thus selected as being the best fit for the data.

Factor extraction using PAF was conducted again, this time forcing six factors for extraction. A table of communalities was provided, which indicated the shared variance explained by the factors. Correlations after factor extraction ranged from .176-.810. Two variables ("interpersonal therapy would be helpful"; "cognitive behavioral therapy would be helpful") had correlations below .30, at .245 and .176 respectively, which indicated that these items did not share sufficient variance with another item and could be removed from further analyses. Therefore, these two items were removed. Subsequent EFA, forcing an extraction of six factors from the now 29-item PMHLS dataset, showed that these six factors explained approximately 60% of the total variance of the factor model.

EFA Step 4: Selection of the Rotational Method. (English) Factor rotation makes it possible to calculate the degree to which variables load onto specific factors, whereby variables will have high loadings on the factor with which they are most related, and small loadings on all other factors (Field, 2013). Orthogonal and oblique rotation are the two common rotation techniques referenced in the literature. Oblique rotation was selected for these data because this method produces factors that can be correlated and is believed to provide more accurate results for research involving human behaviors (Williams, Onsman, & Brown, 2010). Table 4.6 presents results of the EFA 6-factor model using PAF and oblique rotation that was run on the 29 items of the PMHLS English-language dataset (N=269).

Table 4.6 *Pattern Matrix (EFA 6-Factor Model Using PAF, Oblique Rotation)*

Item	Factor					
	1	2	3	4	5	6
Bipolar disorder	.708					
OCD	.708					
Major depressive	.686					
Traumatic stress	.631					
Anxiety disorder	.570					
Brief psychosis	.499					
Baby blues	.496					
I would seek help		.757				
Someone would seek help		.719				
Someone would tell others		.718				
I would tell someone		.718				
People believe tx is effective		.553				
I believe tx is effective		.500				
Talk to partner/friends			-.884			
Spend time outside			-.845			
Include exercise			-.808			
Avoid situations			.575			
I search for MH info from professionals				.822		
I search for MH info online				.739		
I attend MH appointments				.683		
I search for info from friends/family				.665		
I know where to search for MH info				.470		
Women can't manage own problems					.795	
Women could snap out of it					.722	
MHD are a sign of personal weakness					.621	
MHD are not a real medical illness					.540	

Table 4.6 continued *Pattern Matrix (6-factor PAF, Oblique Rotation)*

Item	Factor			
	3	4	5	6
Stressful life events impact pregnancy/postpartum				-.928
Past MH predicts anxiety/depression				-.669
Little social support predicts anxiety/depression				-.630

A review of the factor loadings after rotation demonstrated that correlations that fell under each factor were sufficiently high, and well above the cutoff of .364 recommended for this sample size (Field, 2013; Stevens, 2002). No cross-correlations were evident, meaning that each item loaded strongly onto one and only one factor. Negative correlations occurred for items that were reverse coded. (Prior to conducting reliability analyses, these items were reverse scored). In this case, negative correlations did not impact the significance of the factor loadings.

EFA Step 5: Interpretation. (English) In the last step of EFA, the Pattern Matrix was closely examined to determine which variables were attributable to each factor, the meaning of each factor, and the factor name. At least three variables per factor were required to provide a meaningful interpretation of each factor. The labels given to each factor (in Table 4.7 below) reflected the theoretical and conceptual framework of the perinatal mental health research.

Table 4.7 Identified Factors in the PMHLS English-Language Dataset (N=269)

Factor 1	Knowledge of Perinatal Mood Disorders
Factor 2	Attitudes that Facilitate Help-Seeking
Factor 3	Knowledge of Self-Help Skills
Factor 4	Knowledge of How to Find Mental Health Resources
Factor 5	Attitudes Towards Perinatal Mood Disorders
Factor 6	Knowledge of Risk Factors for Perinatal Mood Disorders

EFA using Principal Axis Factoring (PAF) and oblique rotation on the 29-item PMHLS indicated that a 6-factor model best explained the latent variable of perinatal mental health literacy.

Application of EFA to Spanish-language dataset (N=260)

As with the English-language dataset, the five-step EFA protocol (Williams, Onsman & Brown, 2010) was also applied to the Spanish-language dataset.

EFA Step 1: Examining the suitability of data for factor analysis (Spanish) The sample size of Hispanic women who completed the 34-item PMHLS scale in Spanish was N=260, while the sample to variable ratio was 8:1; both were acceptable samples for factor analysis (see page 94). The correlation matrix for this sample was assessed to identify patterns of relationships among the variables and to identify weak items that could be eliminated. Table 4.8 provides an overview of the 34 items in the PMHLS and the number of correlations each item had with other variables in the scale. Upon close examination of the correlation matrix for the Spanish-language dataset, one variable had no correlations with any other variable and two other variables had one weak correlation with another item (shown in bold and italics).

Table 4.8 *Correlation Matrix of 34-item PMHLS among Spanish-Language Sample (N=260)*

Item	# of Correlations	Range
MHD is a sign of personal weakness	2	.351-.474
MHD are not a real medical illness	**1**	.308
Women can't manage own problems	3	.308-.474
Women could snap out of it if they wanted	2	.324-.351
Women are danger to themselves and baby	**0**	n/a

Table 4.8 continued *Correlation Matrix of 34-item PMHLS among Spanish-Language Sample (N=260)*

Item	# of Correlations	Range
If I had a MHD I would tell someone	3	.369-.581
If I had a MHD I would seek professional help	6	.301-.581
Treatment for MHD would be effective	5	.369-.536
Someone I know with a MHD would tell others	4	.404-.642
Someone I know would seek professional help	5	.317-.642
People believe treatment would be effective	4	.380-.614
If person hurts self, it's ok to call 911	2	.301-.450
If not life threatening, it's ok to tell family	**1**	.317
I search for MH info online	4	.382-.719
I search for MH from doctors/professionals	4	.467-.719
I know where to search for MH info in community	4	.382-.473
I attend appointments with MH providers	4	.401-.599
I search for MH info from partner, friends, family	4	.473-.599
Past MH predicts A or D in pregnancy/postpartum	10	.343-.844
Stressful life events impact pregnancy/postpartum	10	.362-.844
Little social support predicts A or D in preg/post	11	.300-.746
She has a condition called anxiety disorder	11	.411-.621
She has a condition called bipolar disorder	9	.300-.499
She has a condition called traumatic stressor	11	.455-.654
She has a condition called major depression	11	.440-.654
She has a condition called obsessive-compulsive	11	.436-.604
She has a condition called brief psychotic disorder	11	.342-.568
She has postpartum baby blues	11	.382-.609

Table 4.8 continued *Correlation Matrix of 34-item PMHLS among Spanish-Language Sample (N=260)*

Item	# of Correlations	Range
Interpersonal therapy would be helpful	11	.386-.715
Cognitive behavioral therapy would be helpful	11	.385-.715
Include safe forms of exercise in daily routine	3	-.775-.882
Talk with partner/friends about her feelings	3	-.755-.882
Avoid situations that make her anxious/depressed	4	-.300-.804
Spend time outside the home with partner/friends	3	-.804-.848

Items with no or weak correlations indicated that they were not measuring any aspect of perinatal mental health literacy. After review of the items with zero or weak correlations, three items that met these conditions were deleted. Subsequent analyses in EFA were done with the remaining 31 items. The last step in determining if the data were suitable for conducting EFA was to examine the adequacy of the sample. The KMO index for the PMHLS Spanish-language dataset of 31 items (N=260) was .845, while results from Bartlett's test were significant at $p<.000$, together indicating the data were suitable for EFA.

EFA Step 2: Extracting scale factors (Spanish) Factors were extracted using PAF given that the PMHLS Spanish-language data were not normally distributed, as four items were above the skewness and kurtosis cutoff thresholds. Table 4.9 demonstrates these items.

Table 4.9 Measures of Skewness and Kurtosis of Four Items in the PMHLS Dataset (N = 260)

Item	Skewness	Kurtosis
If I had an MHD I would seek professional help	-1.888	4.739
Treatment for MHD would be effective	-1.709	3.175
If person hurts self its ok to call 911 to get help	-2.554	8.867
Talk with partner, family, or friends about her feelings	-2.037	3.271

The next piece of data provided was a table of communalities, which indicated the shared variance explained by the factors. Correlations of the 31 items after factor extraction ranged from .201-.871. Correlations below .3 signaled that an item did not share sufficient variance with another item and could be removed from further analyses. The item "if a person hurts themselves it's okay to call 911 to get help" had a very low correlation of .201 and was removed. EFA using PAF was re-run again with the remaining 30 items in the PMHLS Spanish-language dataset (N=260), with the KMO index (.848) and Bartlett's test ($p<.000$) remaining constant. A review of the updated table of communalities indicated that 30 items had meaningful correlations between .336-.874.

EFA Step 3: Examine criteria to assist in determining factor extraction (Spanish)

The three factor extraction methods previously mentioned – Kaiser's criteria, Scree plot, and parallel analysis – were used to evaluate factors. Table 4.10 provides a summary of the eigenvalues, percent of variance, and cumulative percent of variance for the first ten of 30 factors in the PMHLS Spanish-language dataset.

Table 4.10 *Kaiser's Criteria for 30-item PMHLS Spanish-Language Dataset (N=260)*

Factor	Eigenvalue	% of Variance	Cumulative %
1	7.638	25.459	25.459
2	3.403	11.343	36.803
3	2.927	9.758	46.560
4	2.686	8.953	55.513
5	1.823	6.077	61.590
6	**1.379**	4.595	**66.185**
7	.922	3.074	69.259
8	.835	2.782	72.041
9	.787	2.623	74.663
10	.727	2.424	77.087

Based on results from the application of Kaiser's criteria to select only factors with eigenvalues greater than 1.0, six factors met this criterion and explained approximately 66% of the total variance. Therefore, Kaiser's criterion suggested that six factors should be extracted. Comparisons with results from the Scree plot (Figure 4.2) and parallel analysis were conducted to determine if this was the correct factor model to retain.

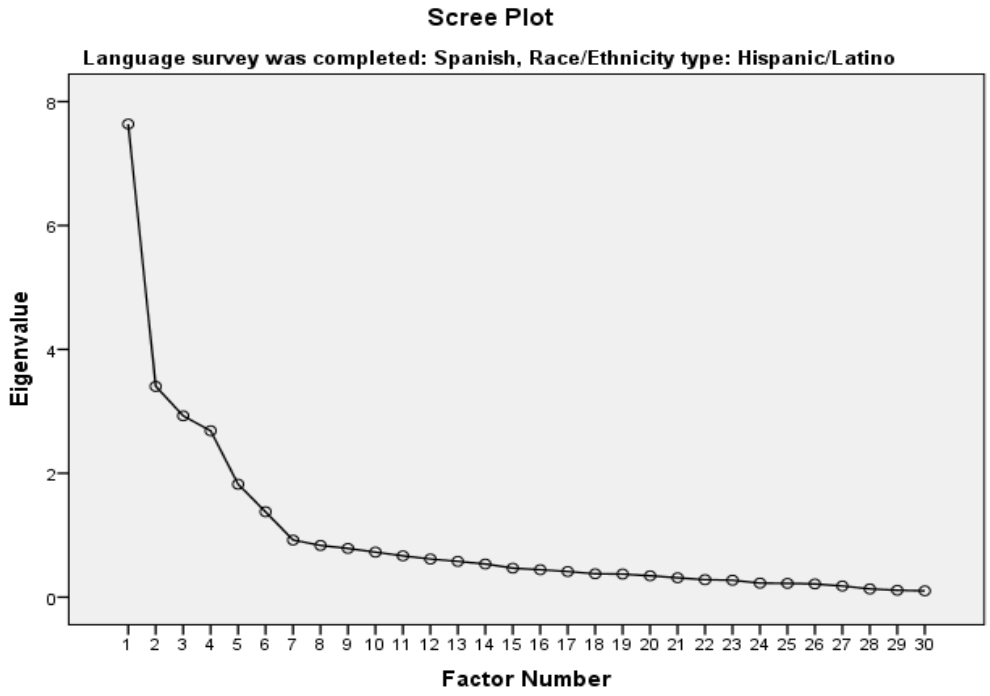

Figure 4.2 *Scree Plot of PMHLS Spanish-Language Dataset (N=260)*

A visual inspection of the Scree plot suggested that if the point of inflection was at Factor 7, then six factors should be retained in the model. These results supported the findings from Kaiser's criteria, which also indicated the retention of six factors. Parallel analysis was also conducted to determine if the results from these two extraction methods were acceptable.

Table 4.11 *Parallel Analysis of 30-item PMHLS Spanish-Language Dataset (N=260)*

```
Principal Components

Specifications for this Run:
Ncases    260
Nvars      30
Ndatsets  100
Percent    95
```

Table 4.11 Continued *Parallel Analysis of 30-item PMHLS Spanish-Language Dataset (N=260)*

Random Data Eigenvalues

Root	Means	Prcntyle
1.000000	1.690314	1.776827
2.000000	1.591305	1.657395
3.000000	1.518539	1.586346
4.000000	1.456158	1.515519
5.000000	1.399231	1.444213
6.000000	**1.347364**	**1.386984**
7.000000	**1.296319**	**1.333827**
8.000000	1.252874	1.288411
9.000000	1.207620	1.241505
10.000000	1.165669	1.197472
11.000000	1.127574	1.161500
12.000000	1.091023	1.119617
13.000000	1.054103	1.086212
14.000000	1.018171	1.048698
15.000000	.984784	1.012721
16.000000	.950827	.978154
17.000000	.915743	.947795
18.000000	.881779	.904530
19.000000	.850354	.881881
20.000000	.819913	.854635
21.000000	.786442	.816349
22.000000	.753490	.785647
23.000000	.721800	.748599
24.000000	.690782	.717172
25.000000	.657646	.683514
26.000000	.628038	.655954
27.000000	.593341	.618364
28.000000	.556895	.586639
29.000000	.522513	.558660
30.000000	.469390	.520647

When comparing the actual eigenvalues that were obtained using Kaiser's criteria (Table 4.10) with the random order eigenvalues generated by parallel analysis (Table 4.11), the point at which actual eigenvalues surpass random order eigenvalues is at Factor 7 (1.379, 1.333 respectively). Results from the parallel analysis suggested that seven factors should be retained, which was different than the estimation of six factors produced by Kaiser's criteria and the Scree plot.

Upon closer inspection of the parallel analysis output, however, there was a very small difference between the actual eigenvalue of 1.379 and the random-order eigenvalue of 1.386 at

Factor 6, a difference of .007. Given this very small difference, a comparison between a six and seven factor model was needed to determine the best model fit for the data. EFA using PAF was implemented with forced extraction of seven factors. The resulting table of communalities provided indicated that the correlations after the extraction of seven factors remained high. However, the resulting table of the total variance explained (e.g. Kaiser's criteria) demonstrated that only six factors had eigenvalues greater than 1 and the Scree plot still suggested the point of inflection at Factor 7, indicating that six factors should be extracted. Given these findings, a 6-factor model was considered the best fit for the 30-item PMHLS Spanish-language data.

EFA Step 4: Selection of the Rotational Method. (Spanish) As with the English-language version, oblique rotation was selected for these data (see page 102 above). A table of communalities was again provided and showed meaningful correlations for 30 items ranging from .336 to .875. Table 4.12 presents the EFA 6-factor model using PAF and oblique rotation that was run on the 30-item PMHLS Spanish-language dataset (N=260).

Table 4.12 *Pattern Matrix (EFA 6-Factor Model Using PAF, Oblique Rotation)*

Item	Factor					
	1	2	3	4	5	6
CBT	.751					
Interpersonal	.735					
Bipolar disorder	.633					
OCD	.647					
Major depressive	.693					
Traumatic stress	.742					
Anxiety disorder	.585					
Brief psychosis	.721					
Baby blues	.685					

Table 4.12 continued *Pattern Matrix (EFA 6-Factor Model Using PAF, Oblique Rotation)*

Item	Factor					
	1	2	3	4	5	6
I would seek help		.701				
Someone would seek help		.762				
Someone would tell others		.673				
I would tell someone		.582				
People believe tx is effective		.639				
I believe tx is effective		.592				
Talk to partner/friends			-.913			
Spend time outside			-.940			
Include exercise			-.926			
Avoid situations			.833			
I search for MH info from professionals				.866		
I search for MH info online				.756		
I attend MH appointments				.731		
I search for info from friends/family				.757		
I know where to search for MH info				.549		
Women can't manage own problems					.661	
Women could snap out of it					.475	
MHD are a sign of personal weakness					.742	
Stressful life events impact pregnancy/postpartum						.904
Past MH predicts anxiety/depression						.854
Little social support predicts anxiety/depression						.706

A review of the factor loadings after rotation demonstrated that correlations that fell under each factor were sufficiently high, and well above the cutoff of .364 recommended for this sample size (Field, 2013; Stevens, 2002). No cross-correlations were evident, meaning that each

item loaded strongly onto one and only one factor. Negative correlations occurred for items that were reverse coded. (Prior to conducting reliability analyses, these items were reverse scored). Negative correlations did not impact the significance of the factor loadings.

EFA Step 5: Interpretation. (Spanish) In this last step, the Pattern Matrix was closely examined to determine which variables were attributable to a factor, the meaning of each factor, and the factor name. At least three variables per factor were required to provide a meaningful representation of each factor. The labels given to each factor (in Table 4.13 below) reflected the theoretical and conceptual framework of the perinatal mental health research.

Table 4.13 Identified Factors in the PMHLS Spanish-Language Dataset (N=260)

Factor 1	Knowledge of Perinatal Mood Disorders
Factor 2	Attitudes that Facilitate Help-Seeking
Factor 3	Knowledge of Self-Help Skills
Factor 4	Knowledge of How to Find Mental Health Resources
Factor 5	Attitudes Towards Perinatal Mood Disorders
Factor 6	Knowledge of Risk Factors for Perinatal Mood Disorders

EFA using Principal Axis Factoring (PAF) and oblique rotation on the 30-item PMHLS indicated that a 6-factor model best explained the latent variable of perinatal mental health literacy among Spanish-language completers.

4.2 Research Question 2: Was the PMHLS a reliable survey instrument?

PMHLS English Language Reliability

Reliability analyses were conducted with the EFA 6-factor model for the PMHLS English-language dataset. EFA findings were assessed for reliability by examining the item

total correlations and Cronbach's Alpha measures of internal consistency for each factor. Table 4.14 provides a summary of the reliability statistics for the six identified factors:

Table 4.14 *Reliability Statistics for the PMHLS-EFA 6-Factor Model (N=269)*

Factor	# items	Item-total correlations	Cronbach's Alpha
1	7	.494-.641	.820
2	6	.459-.648	.823
3	3	.721-.834	.886
4	4	.595-.669	.814
5	4	.479-.645	.763
6	3	.612-.714	.800

Reliability analyses for Factors 1, 2, 5, and 6 provided conclusive results regarding the reliability of those factors. However, Factor 3 (Knowledge of Self-Help Skills) and Factor 4 (Knowledge of How to Find Mental Health Resources) required elimination of an item in each of the factors to improve the measure of Cronbach's Alpha. Specifically, one item that was reverse worded in Factor 3 ("to avoid situations that make her feel anxious or depressed") was eliminated, leaving three items in this factor. This improved Cronbach's Alpha from $\alpha = .185$ to $\alpha = .886$. In Factor 4, removal of one item was suggested because the item had a Cronbach's Alpha value that was higher than the Cronbach's Alpha for the overall factor (suggesting item redundancy). The deletion of this item improved the Cronbach's Alpha slightly, from $\alpha = .805$ to $\alpha = .814$. Four items remained in this factor.

Following recommendations in the literature, the removal of these two additional items required conducting another EFA with the resulting 27-item PMHLS to verify the stability of

the factor structure. The new KMO value for these data was 0.763 and Bartlett's test was significant ($p<.000$), together indicating that these data maintained adequacy for EFA. PAF with the six-factor solution provided a Communalities table that included correlations above .300 for all 27 variables. The revised six factors accounted for approximately 62% of the total variance, and the Scree plot again supported the extraction of six factors. Finally, the implementation of oblique rotation resulted in the 27 items loading onto the same factors as before, indicating that the factor structure previously identified had remained stable.

In conclusion, EFA contributed to the elimination of seven items from the original 34-item English-language PMHLS. In the final model, 27 items loaded strongly onto six factors, indicating that these items were a valid and reliable measure of the latent construct called perinatal mental health literacy.

PMHLS Spanish Language Reliability

Reliability analyses were also conducted with the EFA 6-factor model for the PMHLS Spanish-language dataset. Table 4.15 below provides a summary of the reliability statistics for the six identified factors.

Table 4.15 *Reliability Statistics for the PMHLS/EFA 6-Factor Model (N=260)*

Factor	# items	Item-total correlations	Cronbach's Alpha
1	9	.562-.729	.907
2	6	.505-.669	.822
3	3	.875-.904	.949
4	4	.668-.746	.854
5	3	.387-.486	.627
6	3	.742-.867	.902

Reliability analyses for Factors 1, 2, 5, and 6 provided conclusive results regarding the reliability of those factors. However, Factor 3 (Knowledge of Self-Help Skills) and Factor 4 (Knowledge of How to Find Mental Health Resources) required elimination of an item in each of the factors to improve the measure of Cronbach's Alpha. Specifically, one item that was reverse worded in Factor 3 ("to avoid situations that make her feel anxious or depressed") was eliminated. This improved Cronbach's Alpha from $\alpha = .107$ to $\alpha = .949$, leaving three items in the factor. Factor 4 included one item with individual alpha value that exceeded the alpha value for the factor, suggesting item redundancy. Removing this item slightly improved the Cronbach's Alpha value from $\alpha = .843$ to $\alpha = .854$, leaving four items in this factor.

Again, following recommendations in the literature, removal of two additional items during this process required administering EFA again with the resulting 28 items to verify the stability of the factor structure of the PMHLS. The new KMO value was 0.841 and Bartlett's test was significant ($p<.000$), indicating the adequacy of these data for EFA. PAF with the forced extraction of six factors provided a Communalities table that included correlations above .30 for all 28 variables. These six factors represented approximately 66% of the total variance, with the Scree plot still supporting the extraction of six factors. Finally, the implementation of oblique rotation resulted in the 28 items loading onto the same factors as before, with minimal changes to the correlations, indicating that the 6-factor structure previously identified had remained stable.

In conclusion, the EFA analyses guided the elimination of six items from the original 34-item Spanish-language PMHLS. In the final model, 28 items loaded strongly onto six factors, indicating that these items were a valid and reliable measure of the latent construct of perinatal mental health literacy.

4.3 Research Question 3: Was the PMHLS a valid assessment of perinatal mental health literacy, as demonstrated by CFA, known-groups, convergent, and discriminant validity?

In the validation phase of this study, CFA was conducted to test the construct validity of the English and Spanish-language PMHLS, that is, to determine if the hypothesized 6-factor model identified by EFA was a good fit for the data and thus a valid measure of the perinatal mental health literacy construct. CFA tests of the six-factor PMHLS model were conducted with a different sample of participants that included N = 142 English-language completers and N = 126 Spanish-language completers.

Before CFA analyses were conducted, the demographic characteristics of the English and Spanish-completing samples were compared, and their similarity was considered. Table 4.16 provides a summary of the demographic characteristics of female participants who completed the revised PMHLS in English (N=142) and in Spanish (N=126).

Table 4.16 *Demographic Characteristics of Hispanic Sample Completing Revised-PMHLS*

Characteristic	English (N=142)		Spanish (N=126)	
	#	%	#	%
Age				
18-24	91	64	49	39
25-31	31	22	37	29
32-38	15	11	25	20
39-45	5	3	15	12
Hispanic type:				
Mexican	135	95	121	96
Puerto Rican	2	1	0	0
Cuban	0	0	1	1
Other Hispanic group	5	4	4	3

Table 4.16 continued *Demographic Characteristics of Hispanic Sample Completing Revised PMHLS*

Characteristic	English (N=142)		Spanish (N=126)	
	#	%	#	%
Born in the U.S.				
Yes	123	87	67	53
No	12	9	59	47
Annual Income				
Less than $15,000	19	13	43	35
$15,000-$29,999	50	35	42	34
$30,000-$49,999	39	28	21	17
$50,000 and above	32	23	17	14
Education				
Less than high school	3	2	18	14
HS diploma/GED	29	20	28	22
Some college courses	66	47	30	24
Associates degree	22	15	14	11
Bachelor's degree	21	15	24	19
Master's degree	1	1	11	9
Employment Status				
Unemployed, looking	24	17	17	14
Not looking for work	19	13	45	37
Part-time	65	46	47	39
Full-time	33	23	12	10

Table 4.16 continued *Demographic Characteristics of Hispanic Sample Completing Revised PMHLS*

Characteristic	English (N=142)		Spanish (N=126)	
	#	%	#	%
Pregnancy status				
Yes	42	30	36	29
No	100	70	90	71
Parent				
Yes	47	33	65	52
No	95	67	61	48
Mental Health History				
Yes	72	51	46	37
No	70	49	80	63
BASH Summary				
Only Spanish	6	4	51	40
More Spanish	11	8	24	19
Both	40	28	36	29
More English	42	30	10	8
Only English	43	30	5	4
Recruitment Source				
UTEP	67	47	51	40
Community	75	53	75	60

The characteristics of this participant sample were very similar demographically to the sample collected for the EFA study phase (see page 89, Table 4.1 above). As previously observed, the English and Spanish-language completers were similar in many respects. The majority of English and Spanish-language completers were between the ages of 18-31, of Mexican descent, reported similar ranges of earned annual income, and reported similar current employment status. Also, both groups reported similar ratings for language preference; 60% of English-completers reported that they preferred to communicate in only or mostly English while 59% of Spanish-completers preferred to communicate in only or mostly Spanish. With regard to the BASH ratings, the groups were also similar in the percentages of women who reported using Spanish and English interchangeably (28% of English-completers and 29% of Spanish-completers), suggesting a similar level of acculturation among women completing the scale in English and Spanish.

As seen in the EFA study phase, differences between the two groups were evident with regards to nativity, education levels, and history of receiving mental health treatment for self or a family member. In this sample, 87% of English-completers reported that they were born in the U.S., as compared to 53% of Spanish-completers. With regards to education levels, 22% of English-completers had a high school education or less, as compared to 36% of Spanish-completers. Somewhat different from the participants in the EFA study phase, the educational attainment of English and Spanish-language completers was roughly equivalent. In this sample, 39% of Spanish-completers reported that they obtained a college degree as compared to 31% of English-completers. Lastly, with regards to reported history of receiving mental health treatment, 51% of English-completers as compared to 37% of Spanish-completers affirmed that they or a family member had received previous mental health treatment.

CFA Analyses for the PMHLS English Version

CFA analyses were conducted using the SPSS Amos 25 software program. Conventional measures of model goodness of fit frequently recommended in the literature, such as the Chi-square statistic (x^2), the Comparative Fit Index (CFI), the Tucker Lewis Index (TLI), and the Root Mean Square Error of Approximation (RMSEA) (Shek & Yu, 2014) were used for these analyses. The chi-square statistic, an absolute fit index, tests how well a hypothesized model fits the data; a non-significant p-value indicates a good model fit. A drawback of the chi-square test for this application is that it is very sensitive to sample size. Thus, the larger the sample size, the more likely it is that the test result will be significant regardless of model fit. The other statistics used to test model fit are the Comparative Fit Index (CFI), the Tucker Lewis Index (TLI), and the Root Mean Square Error of Approximation (RMSEA). The fit criteria suggested for each of these are CFI > 0.95; TLI > 0.95, and RMSEA < 0.05. As compared to the Chi-square, the CFI, TLI, and RMSEA are not sensitive to sample size and thus provide a more stable measure of model fit (Shek & Yu, 2014). Table 4.17 provides the model fit statistics for the CFA models using the revised PMHLS English-language dataset (N=142).

Table 4.17 *Goodness of Fit Statistics for the Modified Primary-Order CFA Models*

Model	Modification	x^2	Df	CFI	TLI	RMSEA
MO	Original model	487.81	309	0.85	0.83	0.06
M1	MO, correlated errors u8 & u9	412.90	308	0.91	0.90	0.05
M2	M1, correlated errors u9 & u10	401.05	307	0.92	0.91	0.05
M3	M2, deletion of items 9 & 10	321.70	260	0.94	0.93	0.04
Criterion for goodness of fit		-	-	≥0.95	≥0.95	≤0.05

CFA results from the PMHLS English-language dataset showed that there was an insufficient fit to the model as demonstrated by the fit indexes (x^2=487.81, p<.000; CFI = .852; TLI=.832; and RMSEA=.064). Modification indices such as co-variances were examined to determine how model fit could be improved. Overall, high co-variances between error terms for items 8 and 9, and between 9 and 10 suggested systematic measurement errors in these item responses (Shek & Yu, 2014). With regards to each of those items, the reader was asked to base their response on what they believed another person would do with regard to seeking help for mental health issues. Since these questions required responses based on experiences far removed from their own, it is plausible to suggest that participants may have given the same responses to these items as to those that related to their own experiences with help-seeking. Specifically, removal of items 9 and 10 was suggested because these items did not appear to provide unique information for the factor. Model fit greatly improved after these modifications were made, x^2=321.70, p<.000; CFI = .94; TLI=.93; and RMSEA=.041 (CI .023 - .055).

CFA Analyses for the PMHLS Spanish-Language Version

Table 4.18 provides the model fit statistics for the CFA models using the revised PMHLS Spanish-language dataset (N=126).

Table 4.18 *Goodness of Fit Statistics for the Modified Primary-Order CFA Models*

Model	Modification	x^2	Df	CFI	TLI	RMSEA
MO	Original model	518.61	309	0.88	0.87	0.07
M1	MO, correlated errors u8 & u9	488.20	308	0.90	0.89	0.07
M2	M1, deletion of items 9 and 10	366.38	260	0.93	0.92	0.06
M3	M2, correlated errors u20 & u23	340.44	259	0.95	0.94	0.05
Criterion for goodness of fit		-	-	≥0.95	≥0.95	≤0.05

Similar to the English version, CFA results from the PMHLS Spanish-language dataset also showed that the data were an insufficient fit to the model as demonstrated by its fit indexes (x^2=518.61, p<.000; CFI = .884; TLI=.868; and RMSEA=.074). Modification indices, specifically co-variances, were examined to determine how model fit could be improved. The indices revealed that the error terms for items 8 and 9 were strongly correlated, a finding similar to that described above in the initial CFA for the English-language dataset. In this case, however, including a correlation between the error terms for items 8 and 9 did not greatly improve model fit. It was also noted that, similar to the English-language dataset, there was a strong correlation between the error terms for items 9 and 10. Given that CFA results of the English-language factor model suggested the removal of items 9 and 10 because they did not provide unique information for the factor, those same items were removed to improve model fit. Modification indices also proposed correlating the error terms for items 20 and 23 to improve fit. Model fit greatly improved after these modifications were made, x^2=340.44, p<.000; CFI = .95; TLI=.94; and RMSEA=.050 (CI .034 - .064).

In conclusion, results from CFA showed that a 6-factor model, composed now of 25 items in both the Spanish and English PMHLS, was a good fit for the perinatal mental health literacy construct.

Known-Groups Validity

Known-groups validity, a test of construct validity, is used to establish whether plausible differences can be statistically detected between groups on the basis of a known variable. In this case, it may be logical to suggest that PMHLS scores are higher among women with a history of mental health treatment for self or a family member. Thus, independent sample t-tests were conducted with the samples collected for EFA and CFA to test the differences between the

PMHLS scores of participants who reported a history of self or a family member receiving some sort of mental health treatment versus those who did not. Results from the analysis of EFA data (N=529) showed that participants who reported a history of mental health treatment for themselves or a family member had significantly higher perinatal mental health literacy scores (M = 127.23, SD = 11.60, n = 226) as compared to those that reported no history of mental health treatment (M = 120.61, SD = 12.77, n = 300); t (524) = -6.119, $p < .000$, two-tailed, (95% CI: -8.750, -4.497), $d = .52$.

CFA data was also tested to determine known-groups validity of the revised 27-item PMLHS. Among the combined sample of English- and Spanish-completers (N = 268), participants who reported a history of mental health treatment for themselves or a family member had significantly higher perinatal mental health literacy scores (M = 101.86, SD = 10.78, n = 118) versus those that did not (M = 97.07, SD = 10.34, n = 150); t (266) = -3.694, $p < .000$, two tailed, (95% CI: -7.345, -2.237), $d = .46$.

Convergent Validity

Convergent validity is used in psychometric testing to demonstrate the degree to which constructs that are conceptually related are quantitatively similar. No standardized scales currently exist for measuring perinatal mental health literacy. For the purposes of testing convergent validity, because help-seeking is accepted as a central component of health literacy, the General Help Seeking Questionnaire (GHSQ) was administered to all participants during the CFA study phase. The correlation between the factor item scores from the revised PMHLS related to help-seeking (Factor 2) and scores on the GHSQ was computed. Among English-completers, the revised PMHLS total score for Factor 2 was significantly positively correlated

with the GHSQ r (139) = .402, two-tailed, p < .000. Among Spanish-completers, the revised PMHLS total score for Factor 2 was significantly positively correlated with the GHSQ r (122) = .317, two-tailed, p < .000. The findings demonstrated good convergence between the revised PMHLS help-seeking items in Factor 2 and the GHSQ.

Discriminant Validity

Discriminant validity is used in psychometric testing to demonstrate the degree to which measures that are conceptually unrelated are in fact dissimilar. In this study, discriminant validity was examined by comparing the relationship between participant's total scores on the revised PMHLS and scores on the Kessler scale, a scale that measures general psychological distress. Results of the analyses showed that there was no significant relationship between PMHLS scores and Kessler scores r (142) = .092, two-tailed, p = .278, among English-completers. Furthermore, there was no significant relationship between PMHLS scores and Kessler scores r (126) = .071, two-tailed, p = .431, among Spanish-completers. Results from these correlations indicated that levels of current psychological distress were not related to levels of perinatal mental health literacy.

In conclusion, results from the analyses of both the English and Spanish versions of the revised PMHLS in comparison to the Kessler Scale and the GHSQ provided strong evidence of the construct validity of the PMHLS. More specifically, the results supported the notion that the perinatal mental health literacy construct measured by the PMHLS was convergent with a help-seeking scale, and total PMHLS scores were divergent from a measure of current psychological distress. The combined results supported the validity of the revised PMHLS for measuring perinatal mental health literacy.

4.4 Research Question 4: Did selected demographic variables predict perinatal mental health literacy in this study sample?

A secondary goal of the present study was to explore the extent to which demographic characteristics predicted perinatal mental health literacy. For these analyses, the study samples used for the EFA (N = 518) and CFA phases (N = 262) were reanalyzed, using the final 25-item PMHLS. It was hypothesized that education and income would predict total score on the PMHLS, controlling for age and survey language (English/Spanish). Data collected for the EFA and CFA phases met normality, linearity, lack of multicollinearity, and homoscedasticity assumptions (Field, 2013).

Multiple regression was first conducted with the data collected from the EFA study phase (N = 518). The multiple regression analysis of the predictors was significant. However, the amount of variance explained was not meaningful, and the statistical significance was simply due to the large sample size $F(4, 515) = 4.993$, $p < .001$, $R^2 = .04$. Table 4.19 shows the equation parameters.

Table 4.19 Linear Model Predictors of Perinatal Mental Health Literacy (N=518)

Model 2	*b*	*SE B*	*β*	*p*
Constant	89.20	2.35		p = .000
Education level	1.47	.40	.17	p = .000
Range of Income	.19	.58	.02	p = .751

Multiple regression was also conducted with the data collected from the CFA study phase (N = 262). Results of these analyses showed that education level significantly predicted PMHLS total score. Once more, the amount of variance explained was not meaningful, and the statistical

significance was simply due to the large sample size $F(4, 257) = 3.462$, $p < .009$, $R^2 = .05$. Table 4.20 shows the equation parameters.

Table 4.20 Linear Model Predictors of Perinatal Mental Health Literacy (N=262)

Model 1	*b*	*SE B*	*β*	*p*
Constant	87.33	3.53		p = .000
Education level	1.66	.50	.21	p = .001
Range of Income	.52	.64	.05	p = .417

In review of the findings from the examination of known-groups validity in this data, it appeared that having a history of mental health treatment may be a significant contributor to the total score on the PMHLS. Before entering this variable into the regression model, a chi-square test was conducted to show if there was an association between level of education and history of mental health treatment. The results showed that there was no significant association, suggesting that they are two independent variables, X^2 (5, N = 267) = 8.360, p = 0.137.

As a result of the previous analysis, the variable of history of mental health treatment was added to the regression models of the datasets above. Results of these analyses suggested that when the level of education and history of mental health treatment variables were added to the regression model, these two variables combined significantly predicted the PMHLS total score $F(4, 520) = 13.801$, $p < .000$, $R^2 = .10$. Table 4.21 demonstrates that education and history of mental health treatment significantly predicted the PMHLS total score among Hispanic females who completed the scale in the EFA study phase.

Table 4.21 Linear Model Predictors of Perinatal Mental Health Literacy (N=525)

Model 1	*b*	*SE B*	*β*	*p*
Constant	86.07	2.28		p = .000
MH History	5.39	.93	.25	p = .000
Education	1.28	.38	.15	p = .001

Regression analysis that included the history of mental health treatment variable was also conducted with the dataset from the confirmatory phase (N=267). Results of this analysis also suggested that the variables of education and history of mental health treatment significantly predicted the PMHLS total score $F(4, 262) = 7.546$, $p < .000$, $R^2 = .10$. Table 4.22 shows the equation parameters.

Table 4.22 Linear Model Predictors of Perinatal Mental Health Literacy (N=267)

Model 1	*b*	*SE B*	*β*	*p*
Constant	85.79	3.08		p = .000
MH History	5.09	1.25	.24	p = .000
Education	1.43	.47	.18	p = .003

Means and Standard Deviations of PMHLS Scores

Given the relatively low associations between perinatal mental health literacy and the demographic variables of education and history of mental health treatment, the means and standard deviations of PMHLS scores were computed to identify scoring patterns among the different subgroups. The highest possible score on the 25-item PMHLS was 125 points. Tables 4.23 and 4.24 present PMHLS mean scores by level of education and history of mental health

treatment in the surveys completed by English (N=269) and Spanish-completers (N=260) in the exploratory phase.

Table 4.23 PMHLS Mean Scores by Education Level (N=529)

Education Level	**Mean (SD) English**	**Mean (SD) Spanish**
Less than HS	90.86 (14.04)	86.56 (13.84)
High School/GED	90.45 (11.35)	92.23 (10.95)
Taken some college courses	93.25 (8.22)	92.29 (11.94)
Associate degree	95.73 (7.90)	92.00 (9.69)
Bachelor's degree or higher	94.90 (9.58)	94.94 (10.95)

Table 4.24 PMHLS Mean Scores by History of Mental Health Treatment (N=529)

Mental Health History	**Mean (SD) English**	**Mean (SD) Spanish**
Yes	95.77 (9.14)	96.35 (10.07)
No	91.29 (8.75)	89.31 (12.14)

Means and standard deviations of PMHLS scores across different subgroups were also computed using data collected in the CFA phase (N = 268). Tables 4.25 and 4.26 present the PMHLS mean scores by level of education and history of mental health treatment in the surveys completed by English (N=142) and Spanish-completers (N=126).

Table 4.25 PMHLS Mean Scores by Education Level (N=268)

Education Level	Mean (SD) English	Mean (SD) Spanish
Less than HS	92.67 (15.95)	87.61 (12.75)
High School/GED	92.38 (8.68)	85.32 (11.14)
Taken some college courses	91.61 (8.24)	94.57 (8.84)
Associate degree	92.64 (7.73)	94.86 (11.17)
Bachelor's degree or higher	93.68 (12.51)	95.46 (11.88)

Table 4.26 PMHLS Mean Scores by History of Mental Health Treatment (N=268)

Mental Health History	Mean (SD) English	Mean (SD) Spanish
Yes	95.35 (9.74)	94.85 (11.20)
No	89.10 (7.16)	89.99 (11.76)

Descriptive Comparison of Factor Scores by Education and History of Mental Health Treatment

The goal of the explorative analyses using the EFA and CFA sample data was to identify subject characteristics that might be associated with PMHLS scores, and thus, could indicate hypotheses for future research attempting to determine which subgroups of women are at greatest risk for low perinatal mental health literacy. For this reason, the patterns of factor scores were examined and compared. To facilitate this comparison, 25-item PMHLS Factor scores from the EFA and CFA data were converted to z-scores (mean of zero and a standard deviation of one). The factor Z-score patterns for the EFA (N=528) and CFA (N=268) data are shown in Figures 4.31 to 4.54. The meaning of these graphs will be considered in the Discussion below.

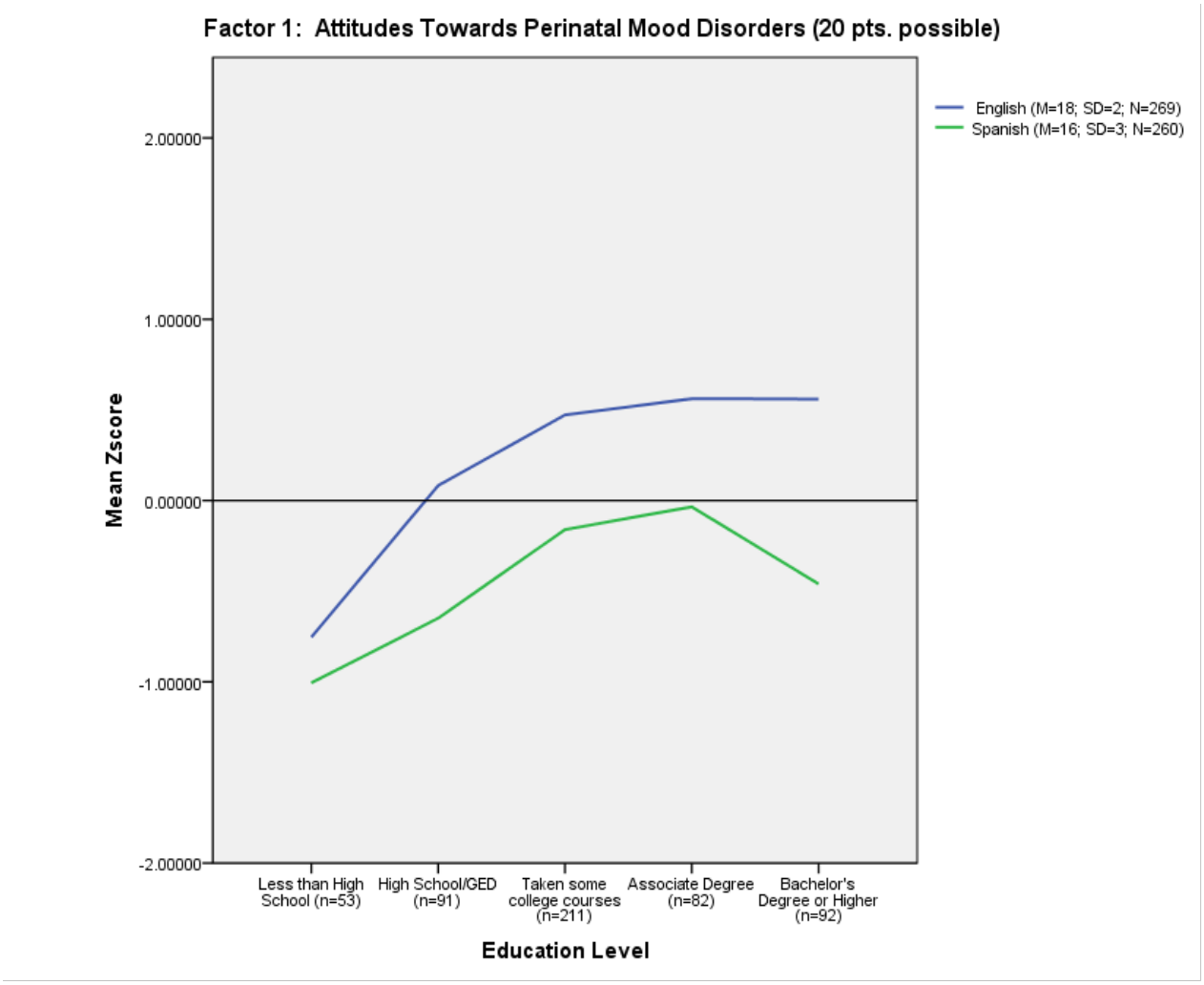

Figure 4.31 Mean Factor Z-Scores by Level of Education and Language (Factor 1)

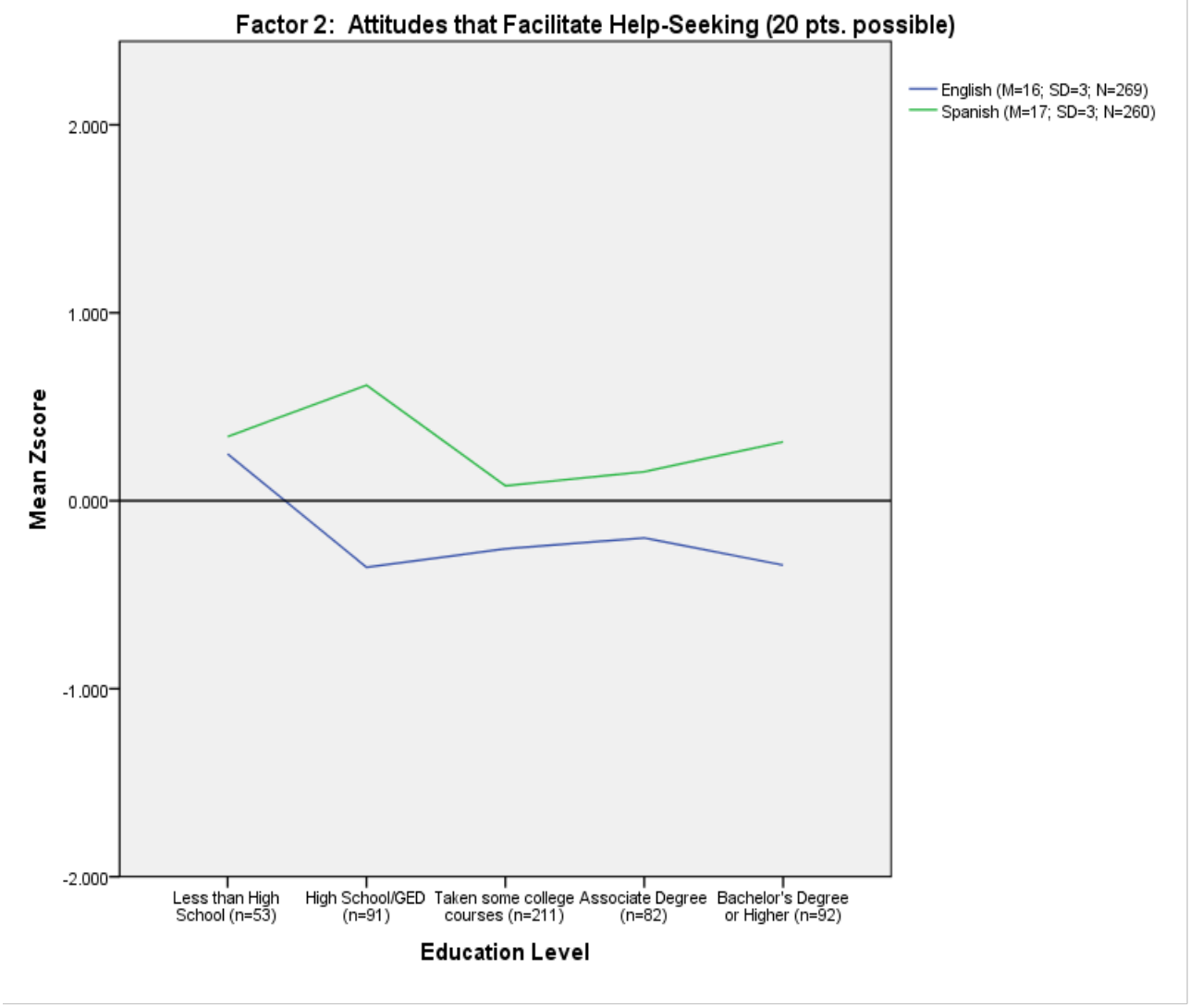

Figure 4.32 Mean Factor Z-Scores by Level of Education and Language (Factor 2)

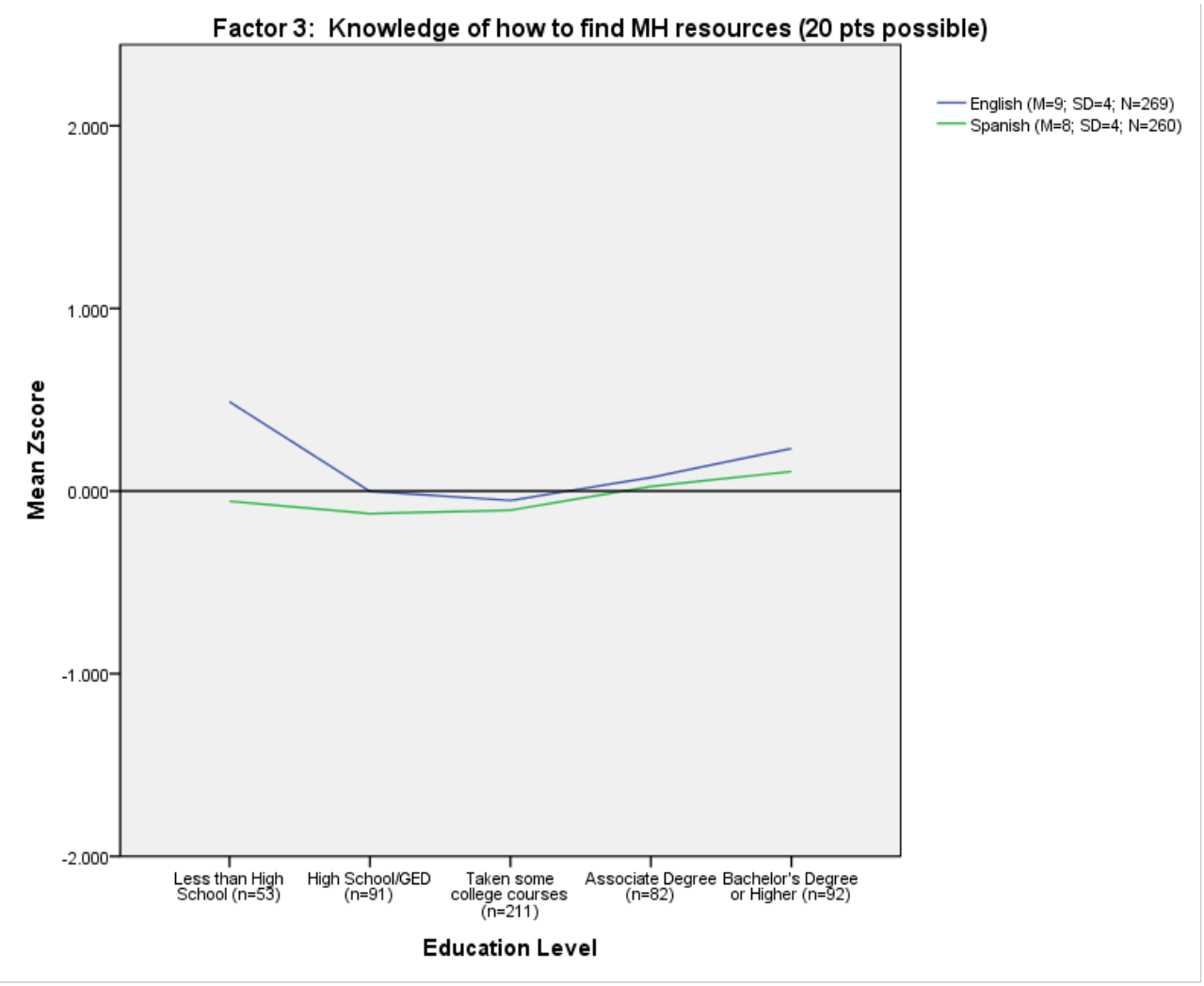

Figure 4.33 Mean Factor Z-Scores by Level of Education and Language (Factor 3)

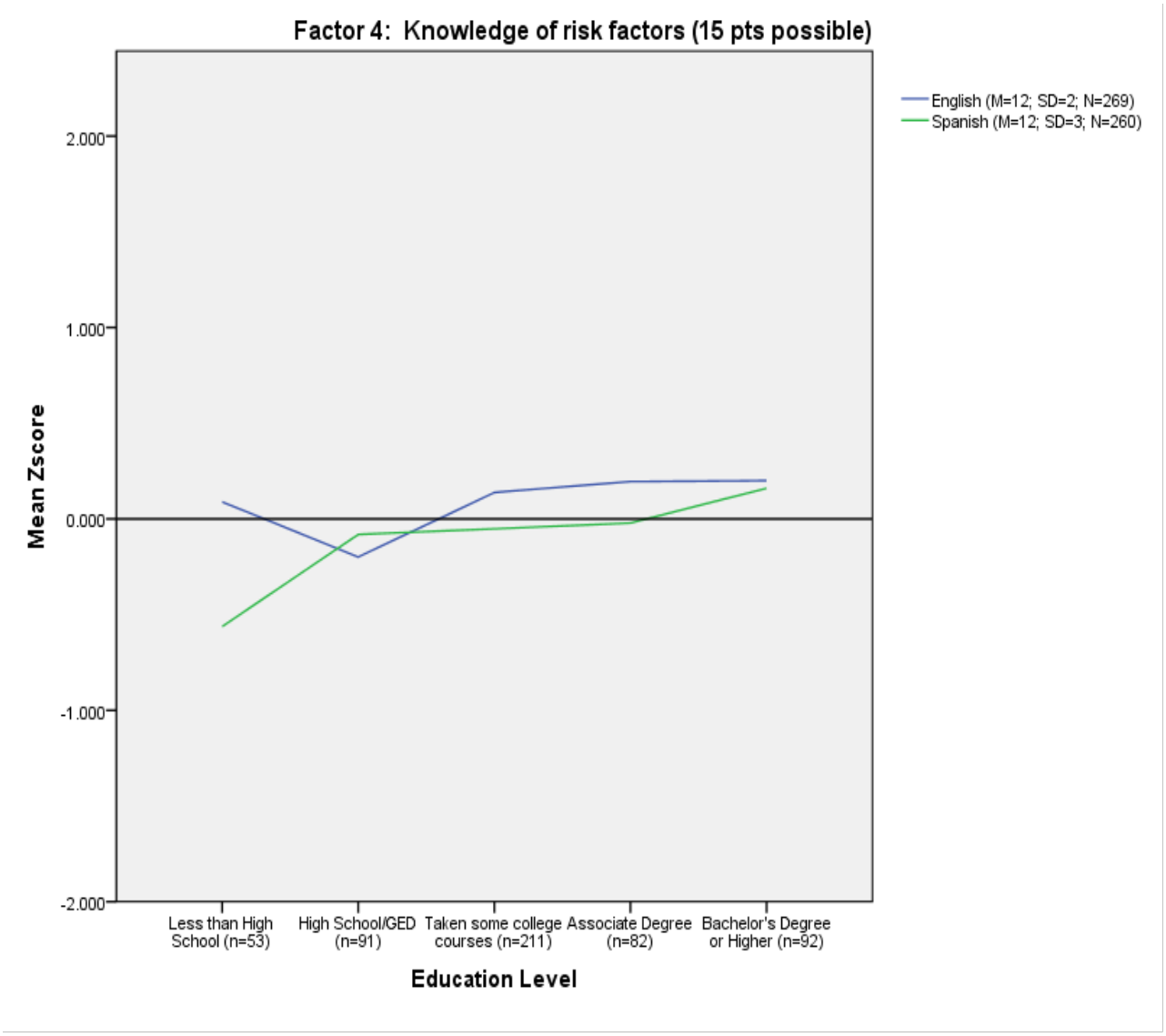

Figure 4.34 Mean Factor Z-Scores by Level of Education and Language (Factor 4)

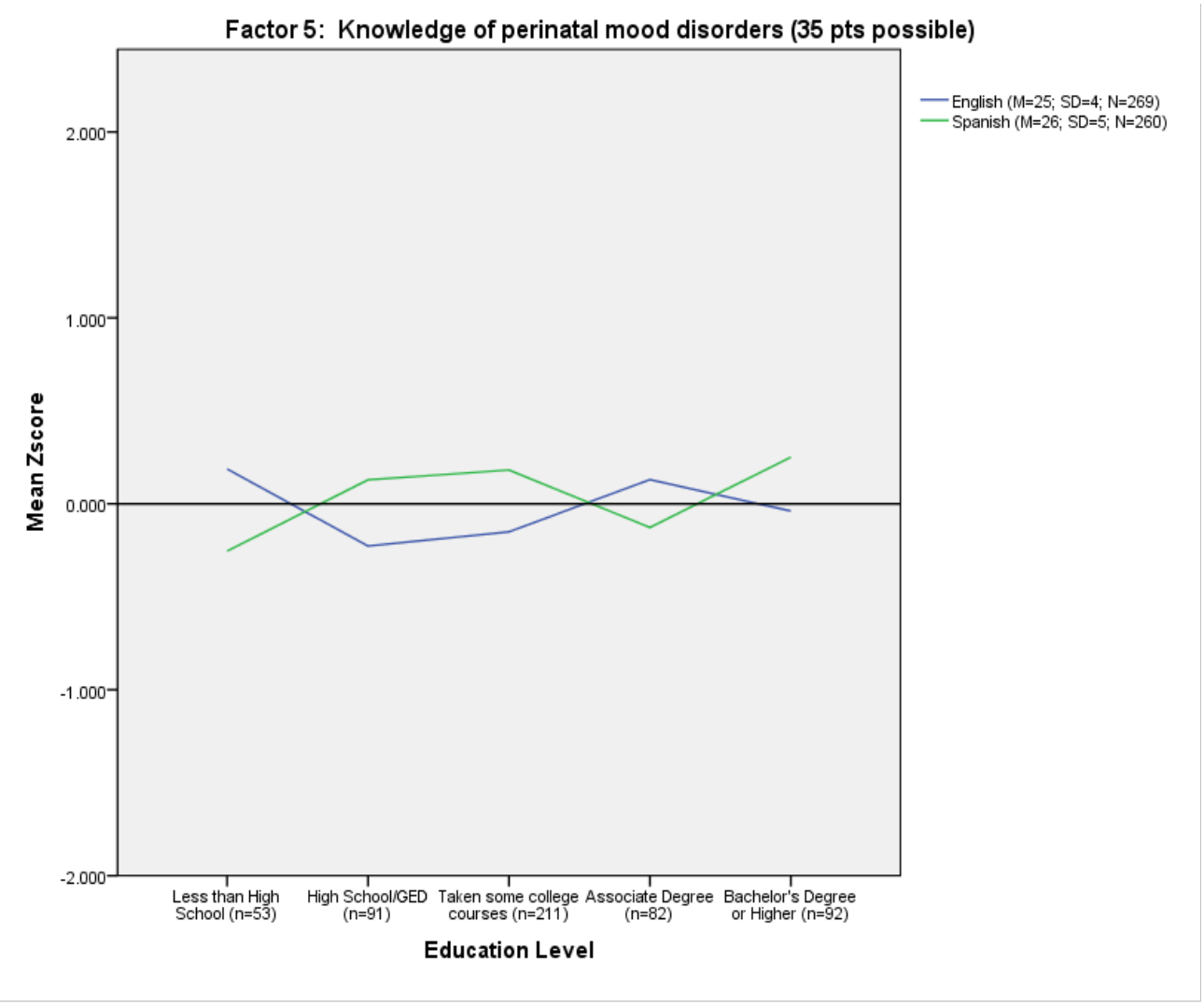

Figure 4.35 Mean Factor Z-Scores by Level of Education and Language (Factor 5)

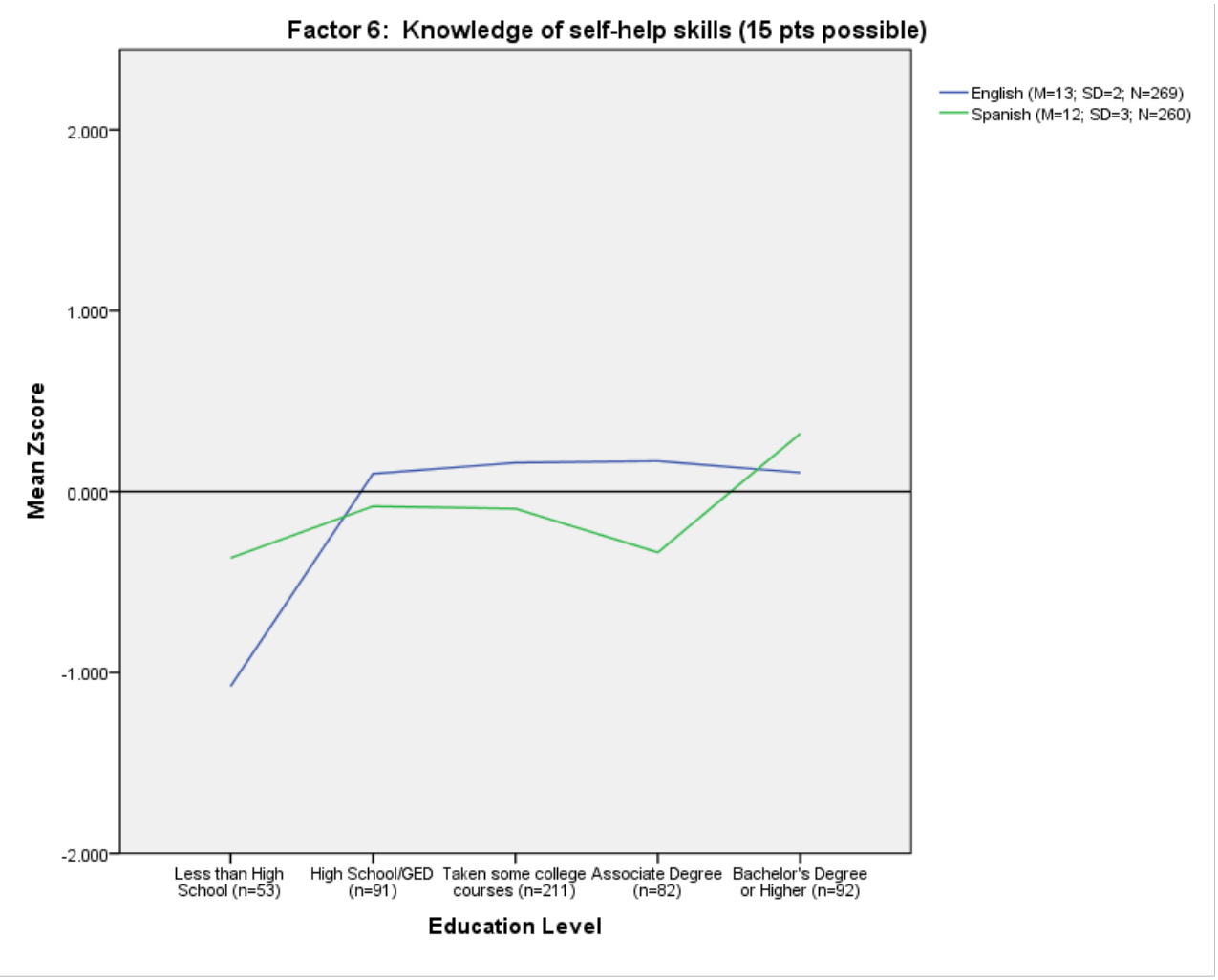

Figure 4.36 Mean Factor Z-Scores by Level of Education and Language (Factor 6)

Mean Factor Z-Scores by Level of Education and Language – Confirmatory Data (N=268)

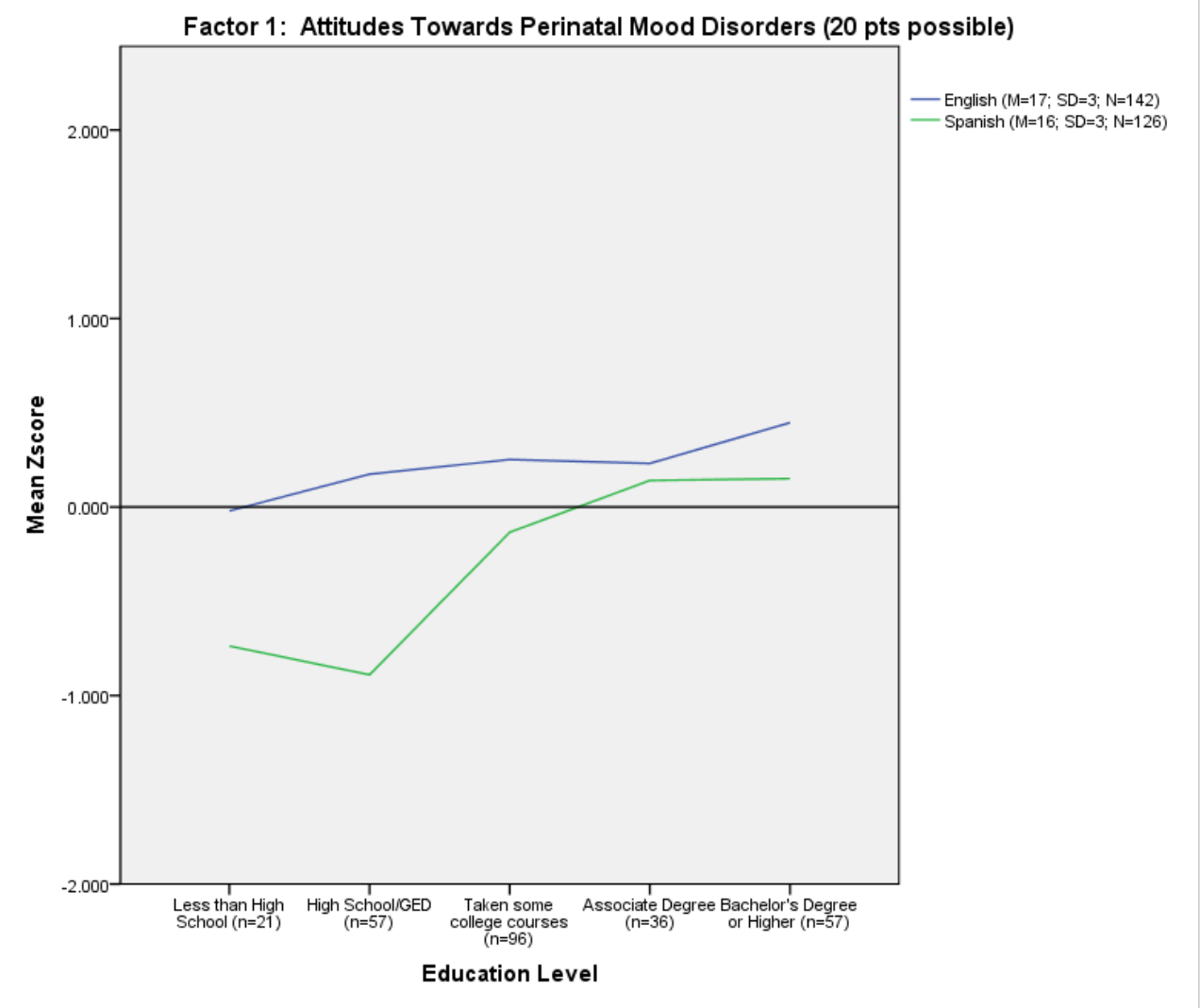

Figure 4.37 Mean Factor Z-Scores by Level of Education and Language (Factor 1)

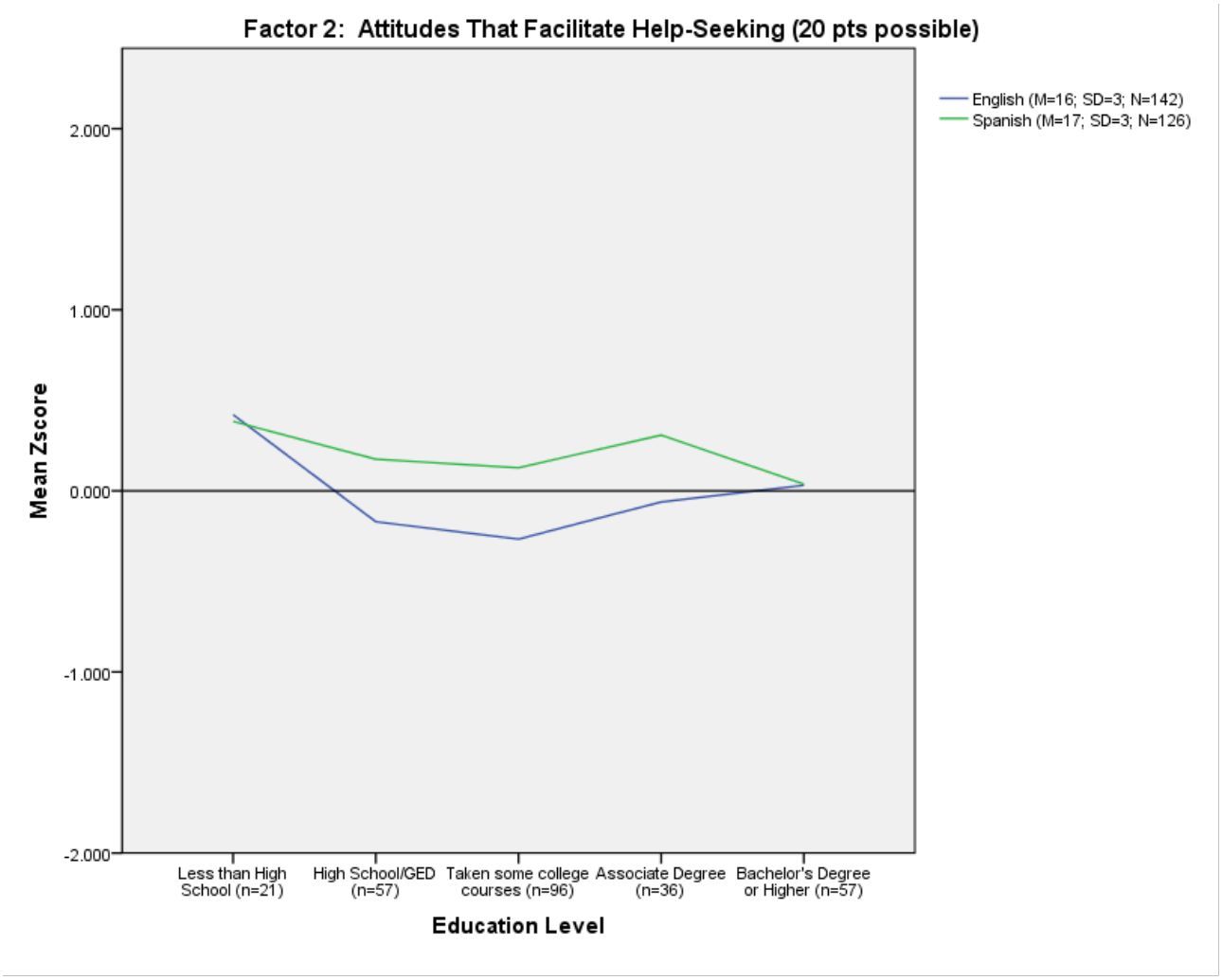

Figure 4.38 Mean Factor Z-Scores by Level of Education and Language (Factor 2)

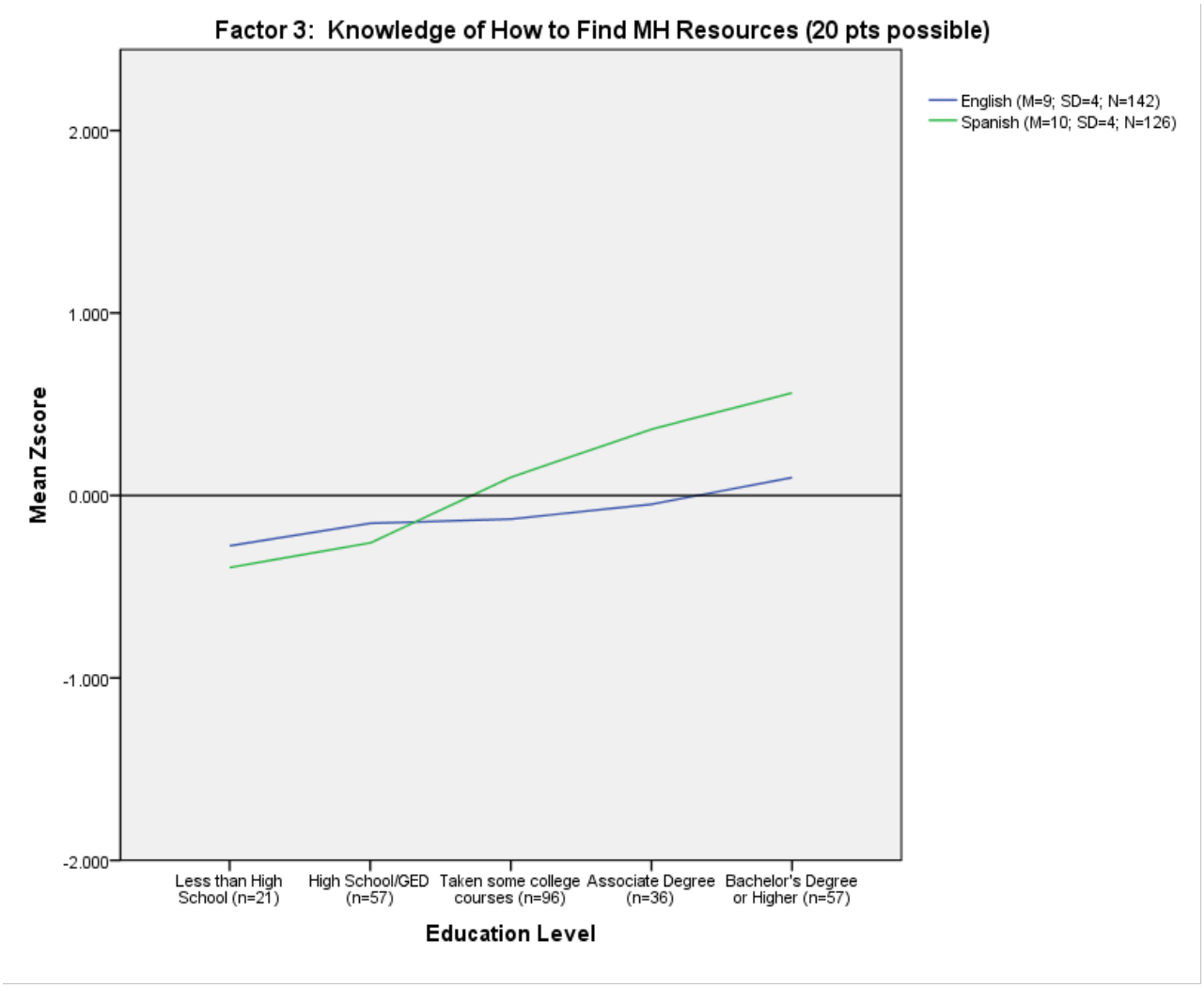

Figure 4.39 Mean Factor Z-Scores by Level of Education and Language (Factor 3)

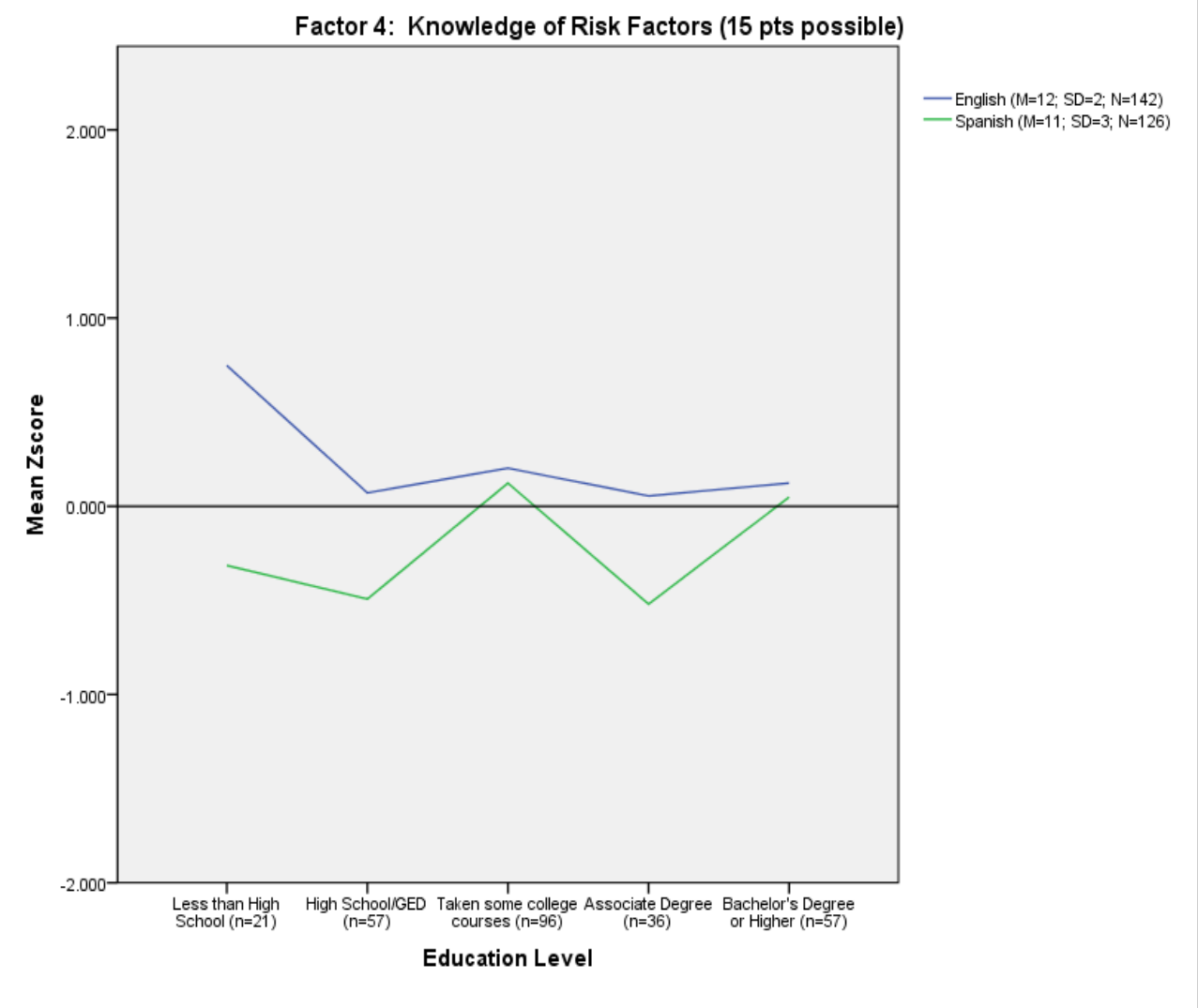

Figure 4.40 Mean Factor Z-Scores by Level of Education and Language (Factor 4)

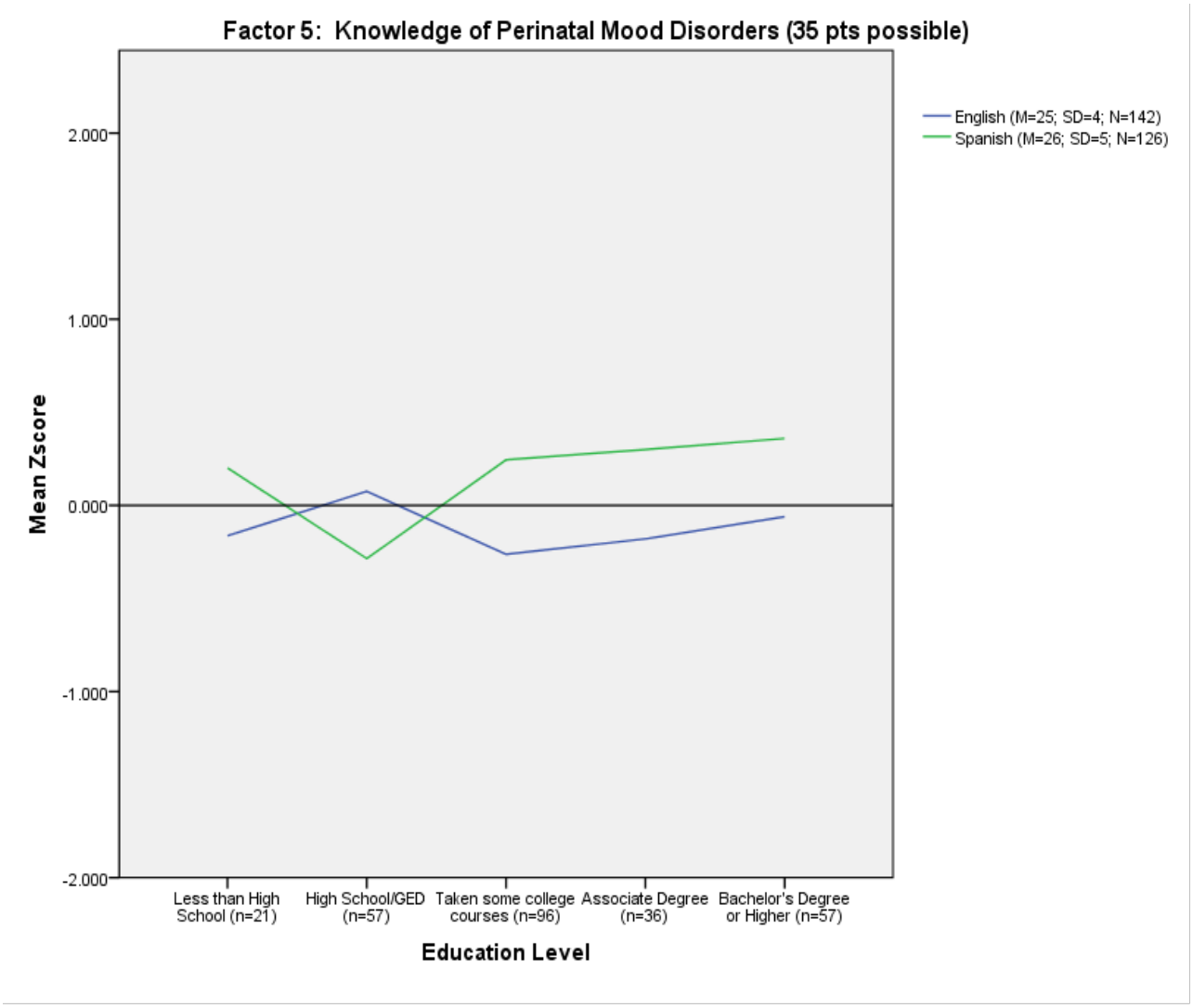

Figure 4.41 Mean Factor Z-Scores by Level of Education and Language (Factor 5)

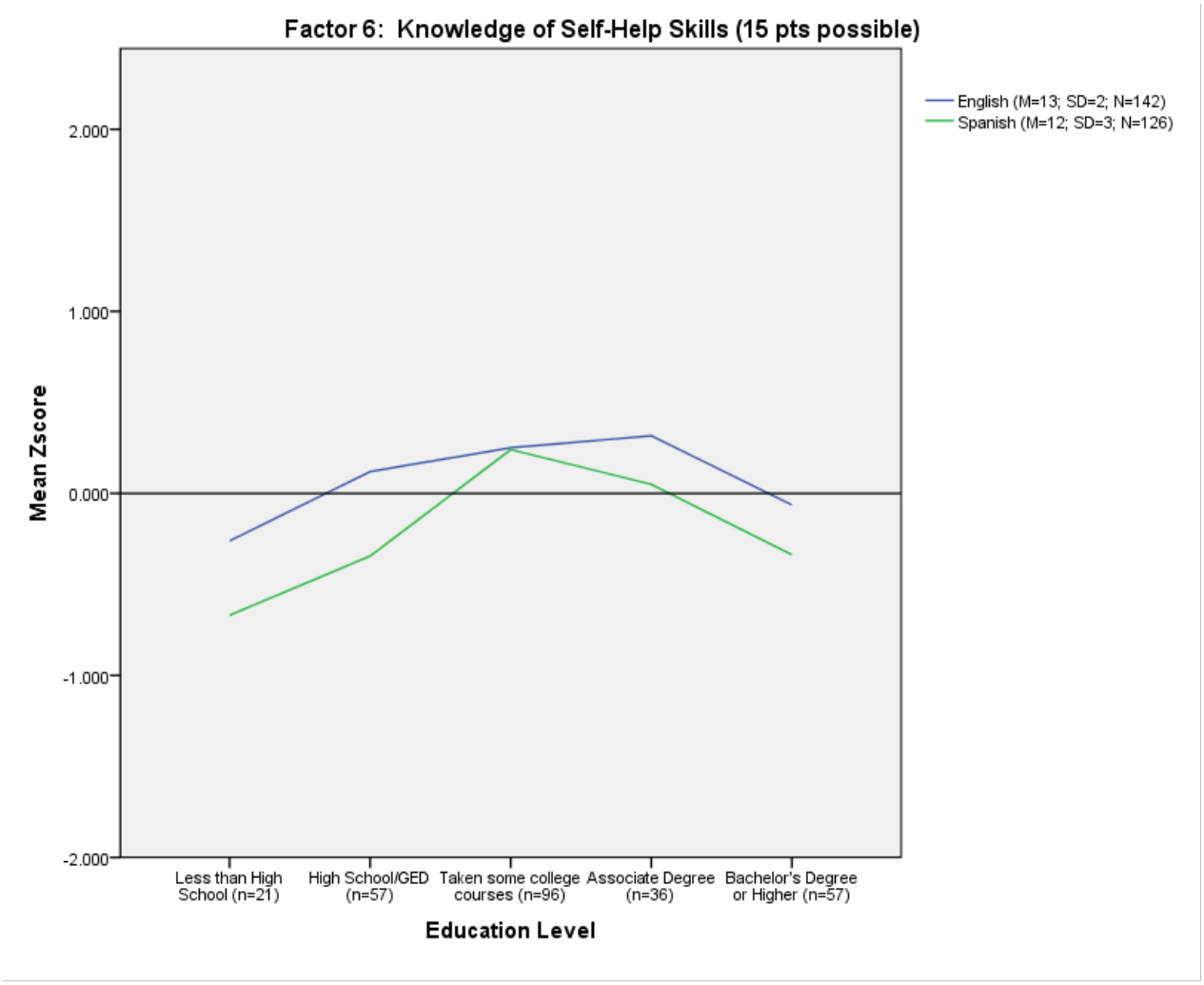

Figure 4.42 Mean Factor Z-Scores by Level of Education and Language (Factor 6)

Mean Factor Z-Scores by History of MH Treatment and Language – Exploratory Data (N=528)

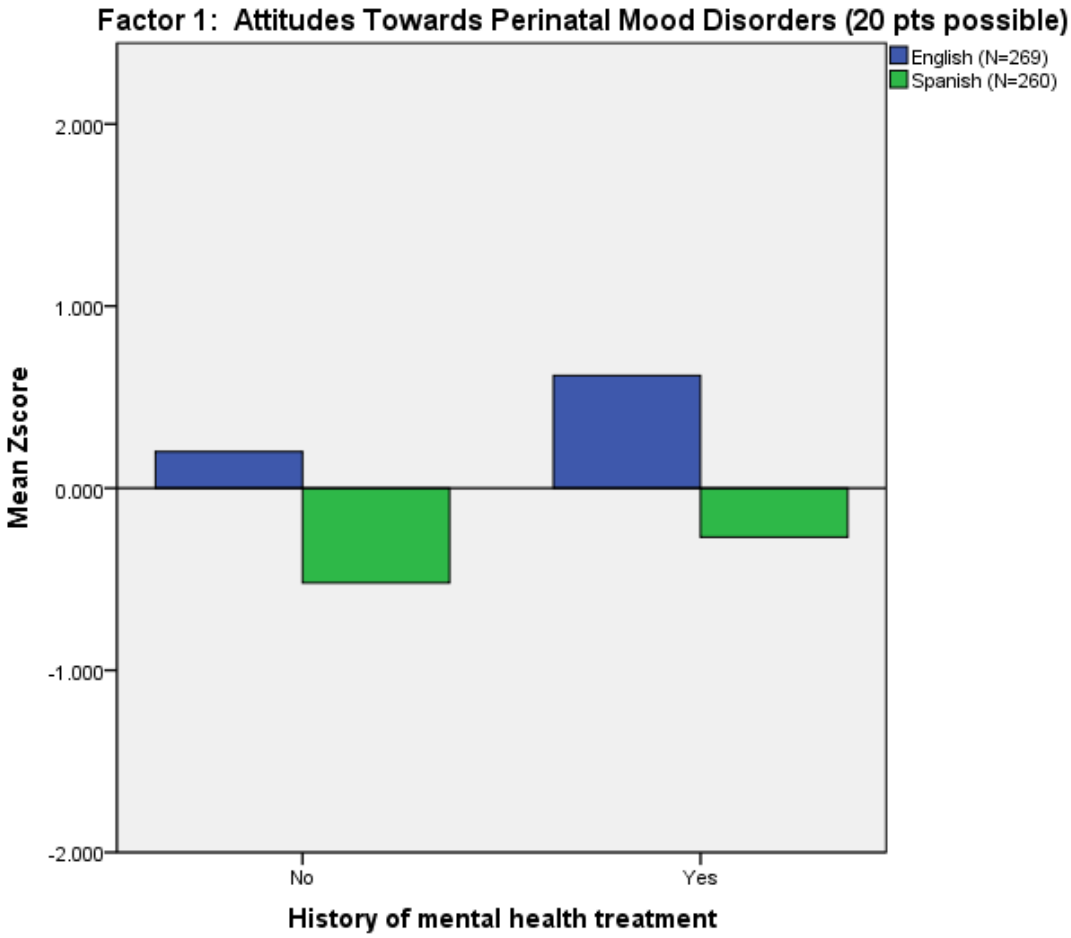

Figure 4.43 Mean Factor Z-Scores by History of MH Treatment and Language (Factor 1)

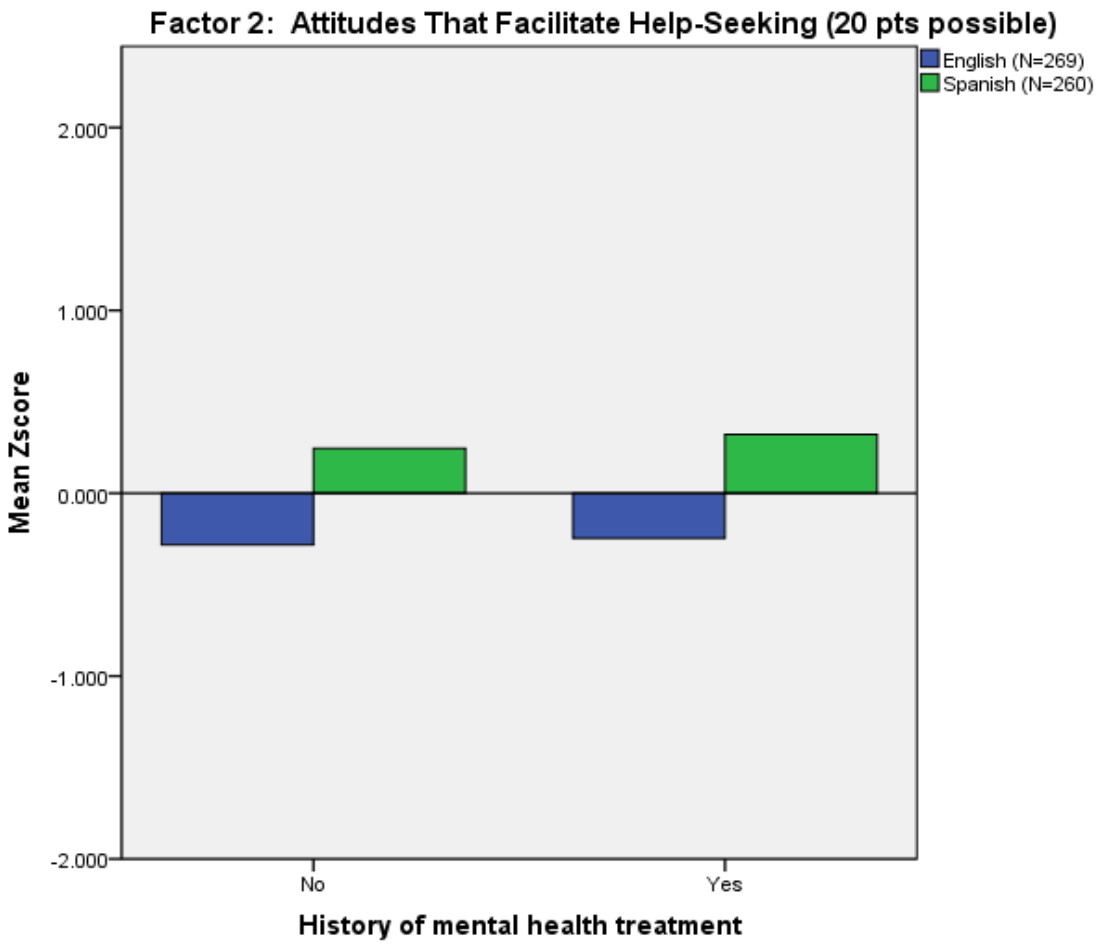

Figure 4.44 Mean Factor Z-Scores by History of MH Treatment and Language (Factor 2)

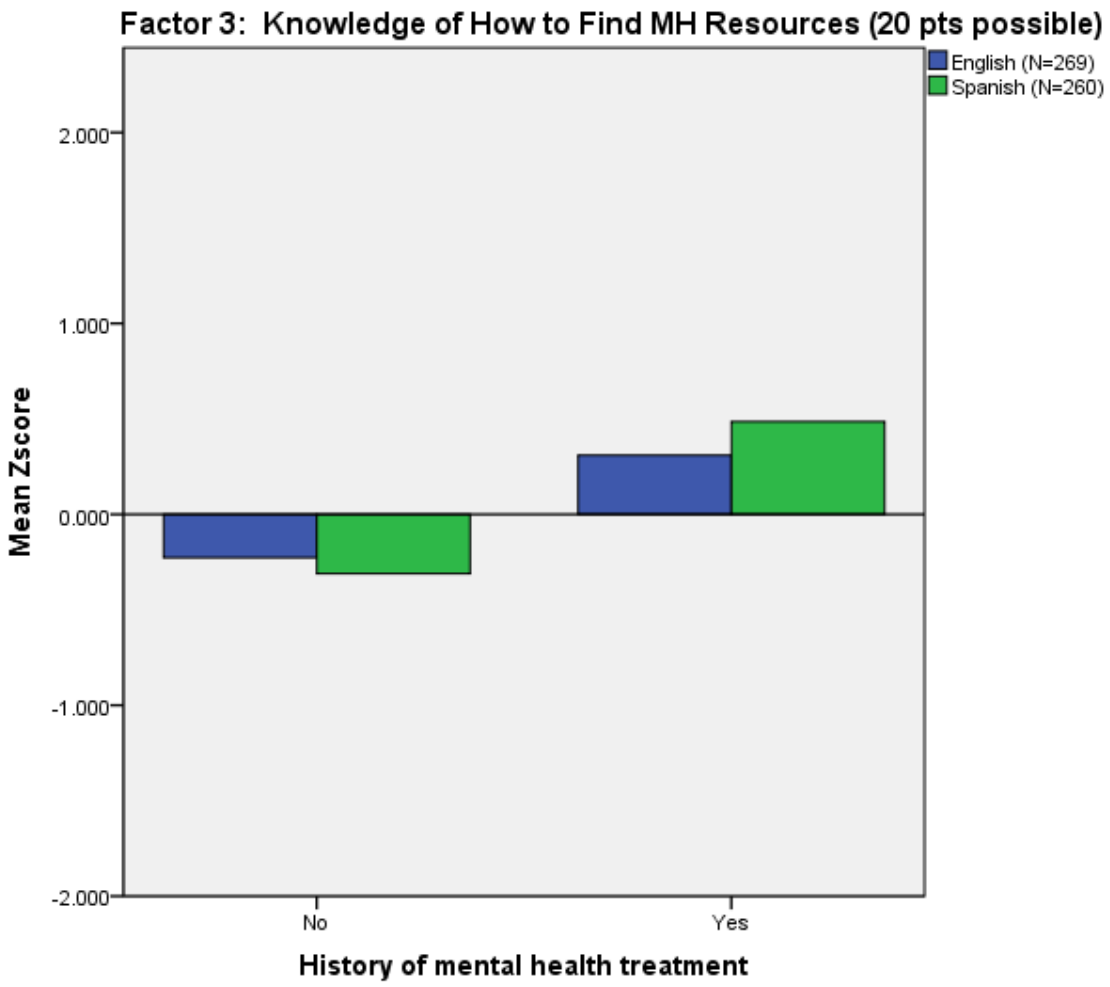

Figure 4.45 Mean Factor Z-Scores by History of MH Treatment and Language (Factor 3)

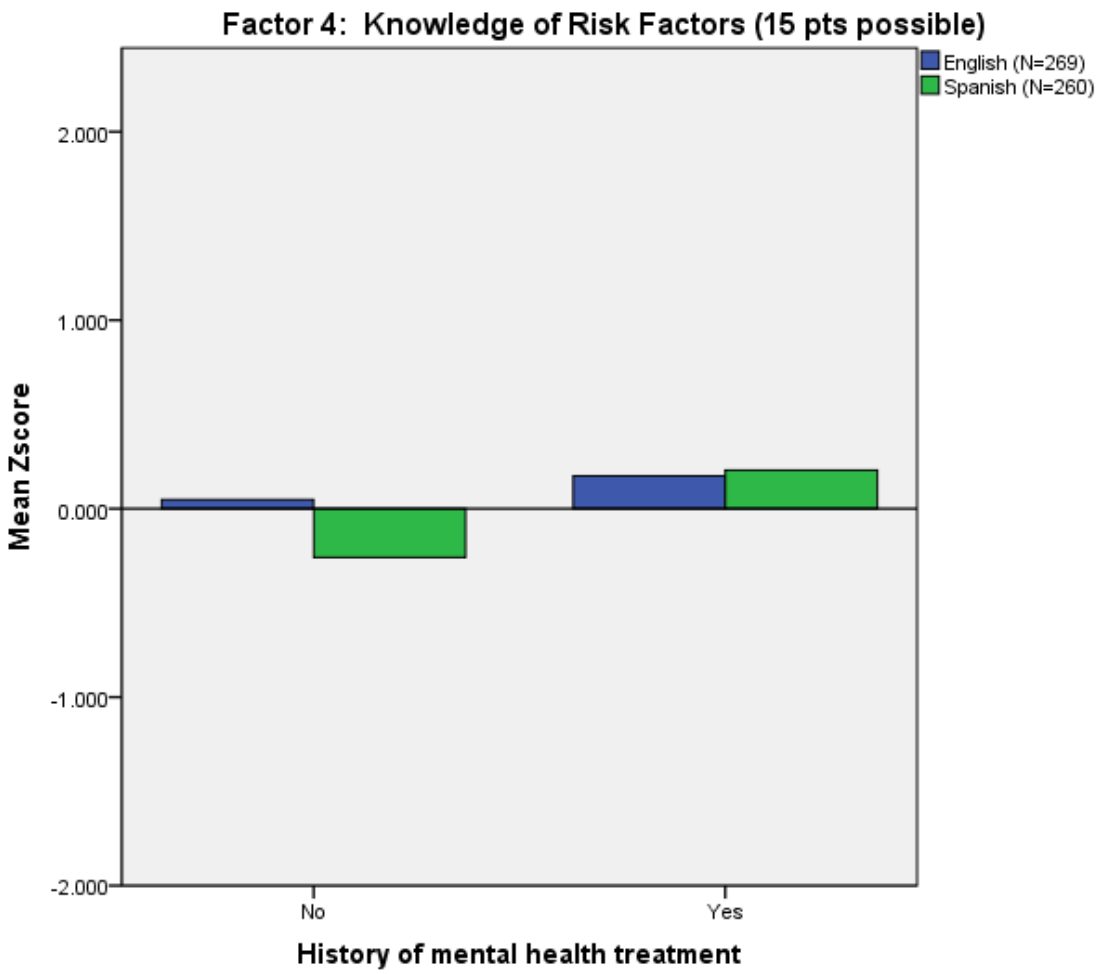

Figure 4.46 Mean Factor Z-Scores by History of MH Treatment and Language (Factor 4)

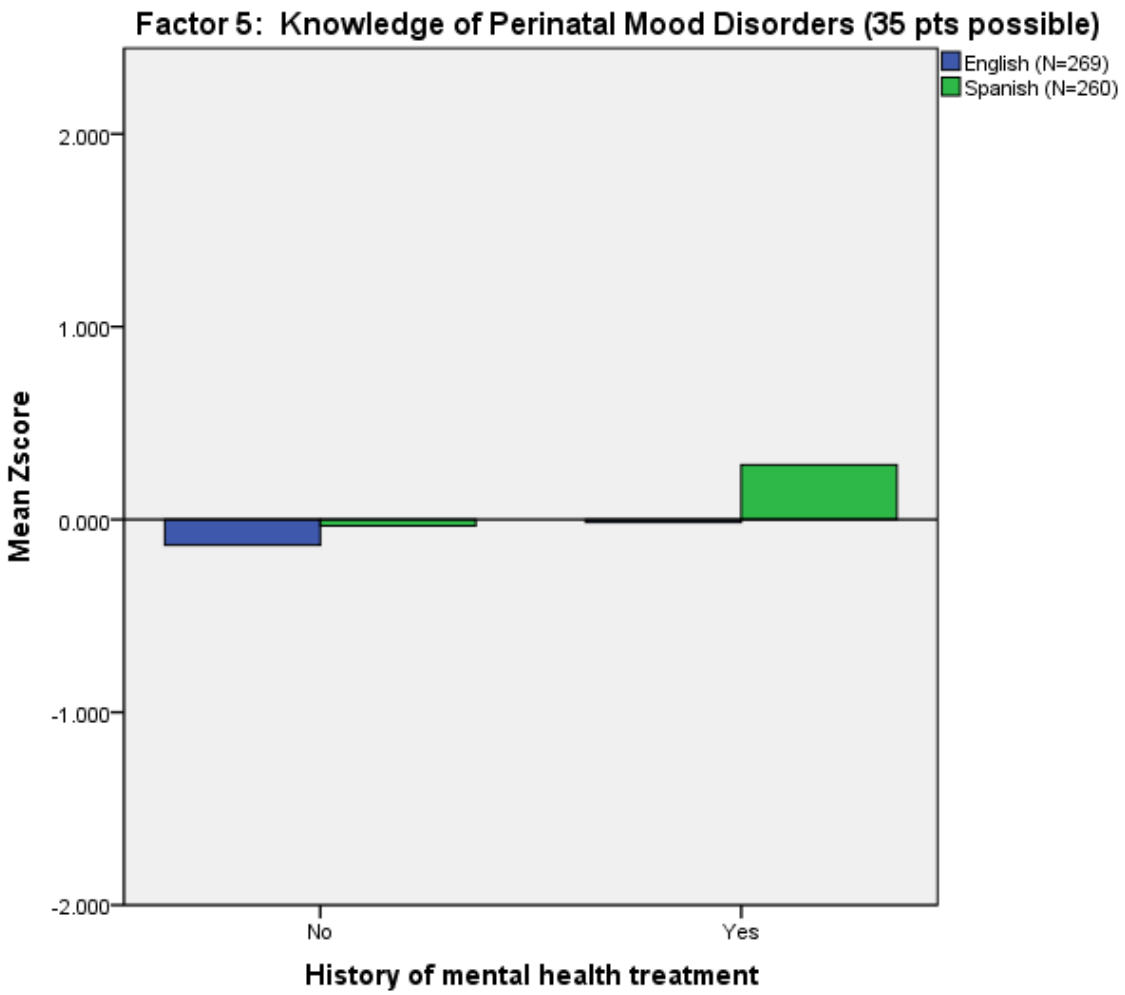

Figure 4.47 Mean Factor Z-Scores by History of MH Treatment and Language (Factor 5)

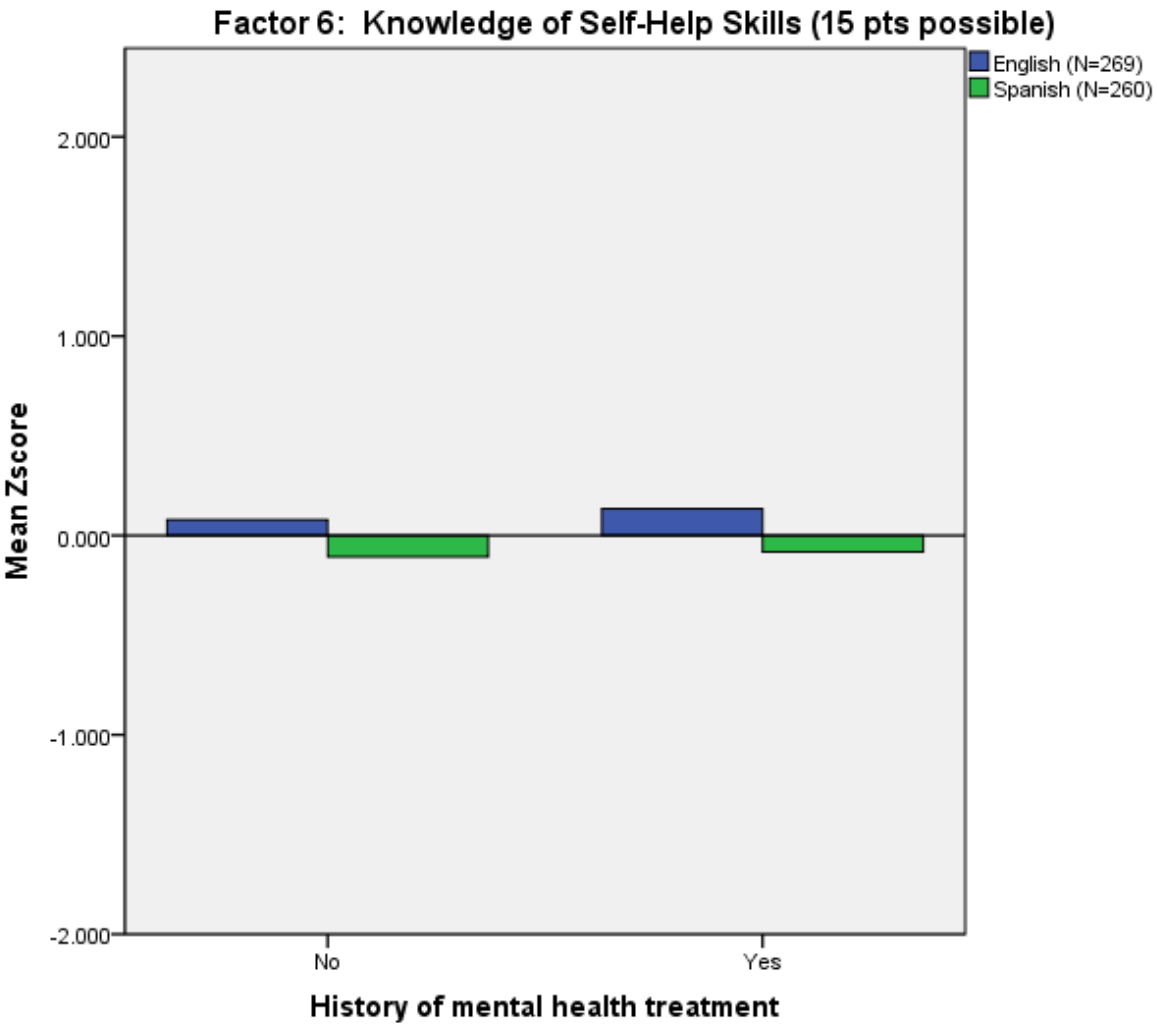

Figure 4.48 Mean Factor Z-Scores by History of MH Treatment and Language (Factor 6)

Mean Factor Z-Scores by History of MH Treatment and Language – Confirmatory Data (N=268)

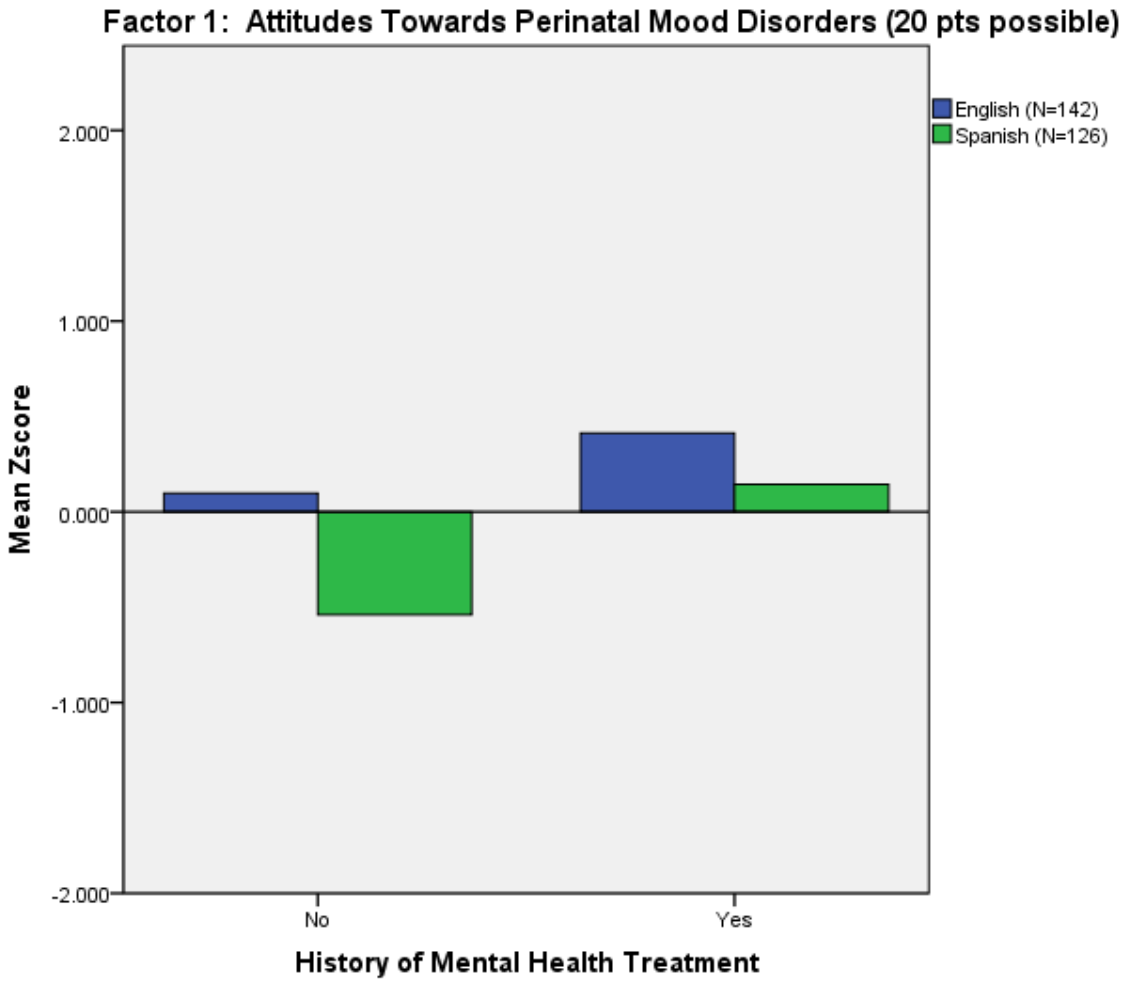

Figure 4.49 Mean Factor Z-Scores by History of MH Treatment and Language (Factor 1)

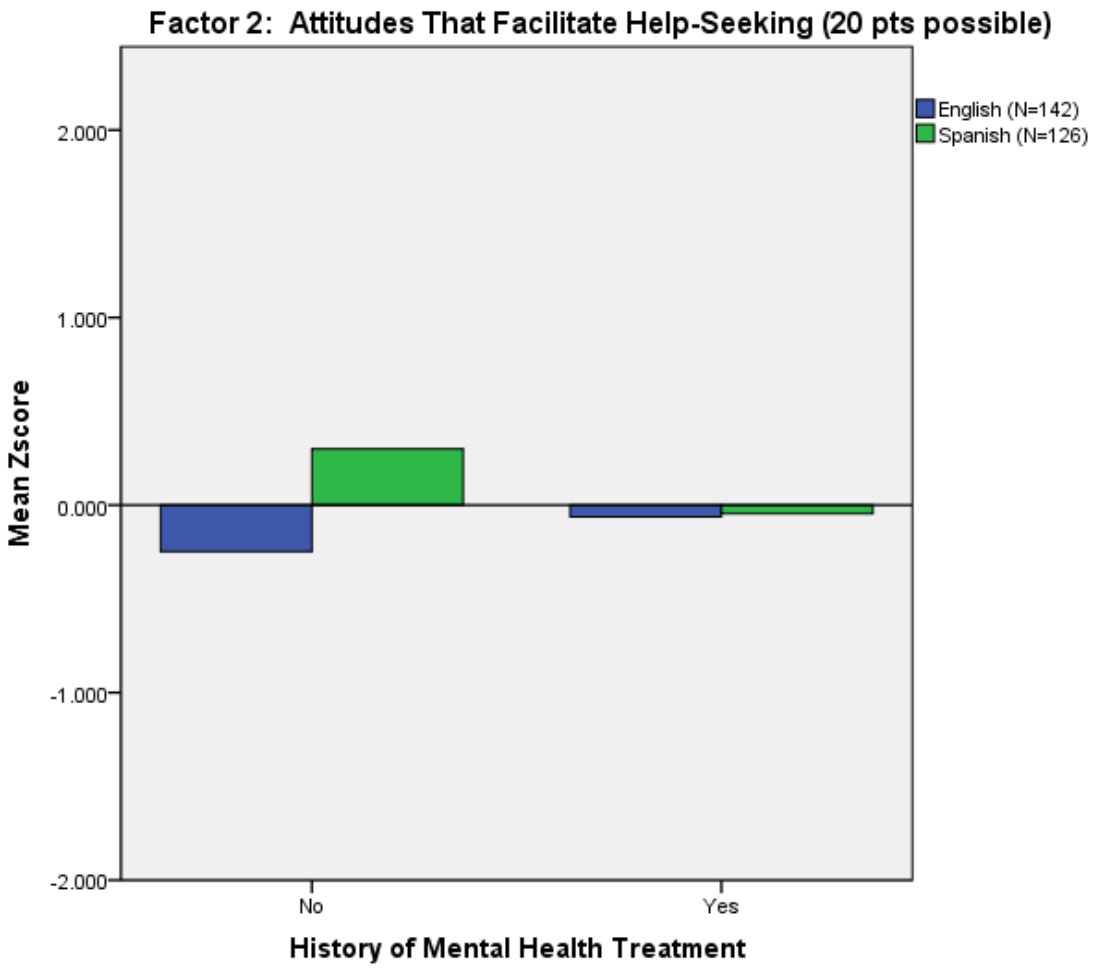

Figure 4.50 Mean Factor Z-Scores by History of MH Treatment and Language (Factor 2)

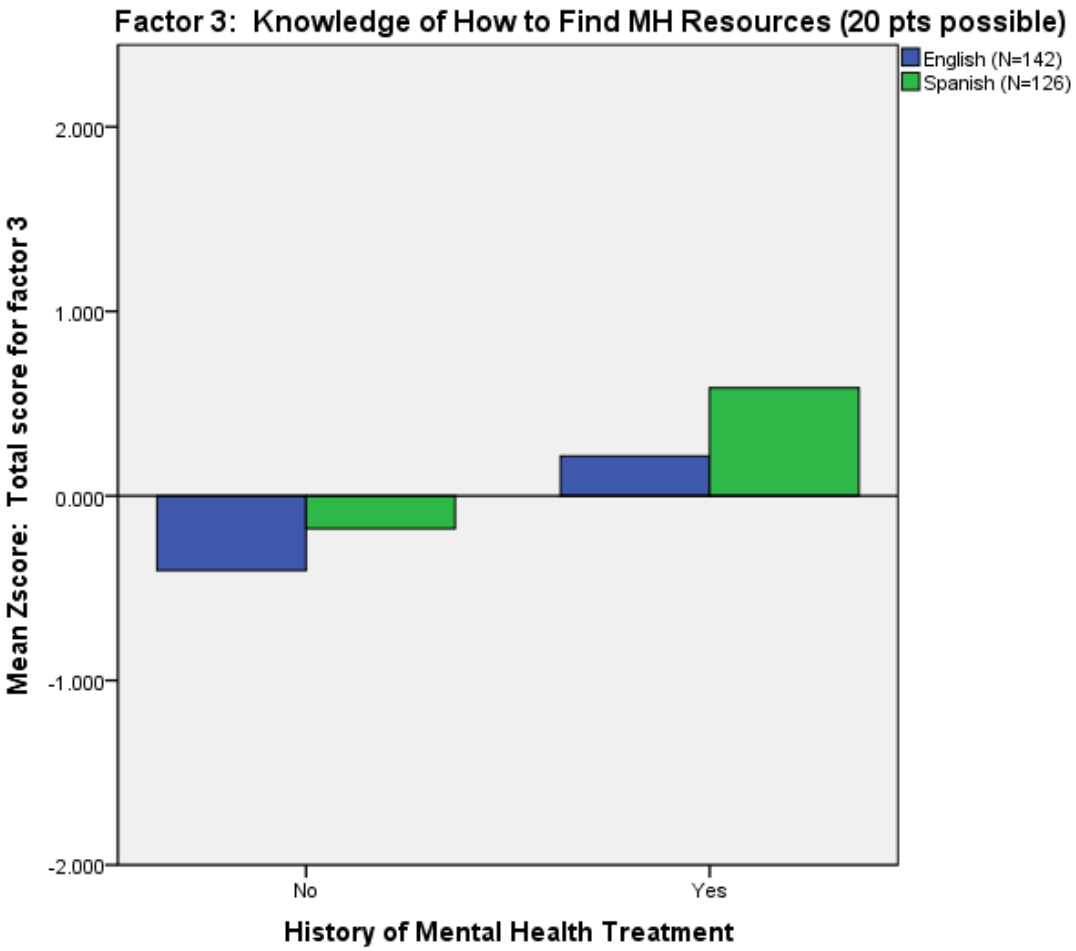

Figure 4.51 Mean Factor Z-Scores by History of MH Treatment and Language (Factor 3)

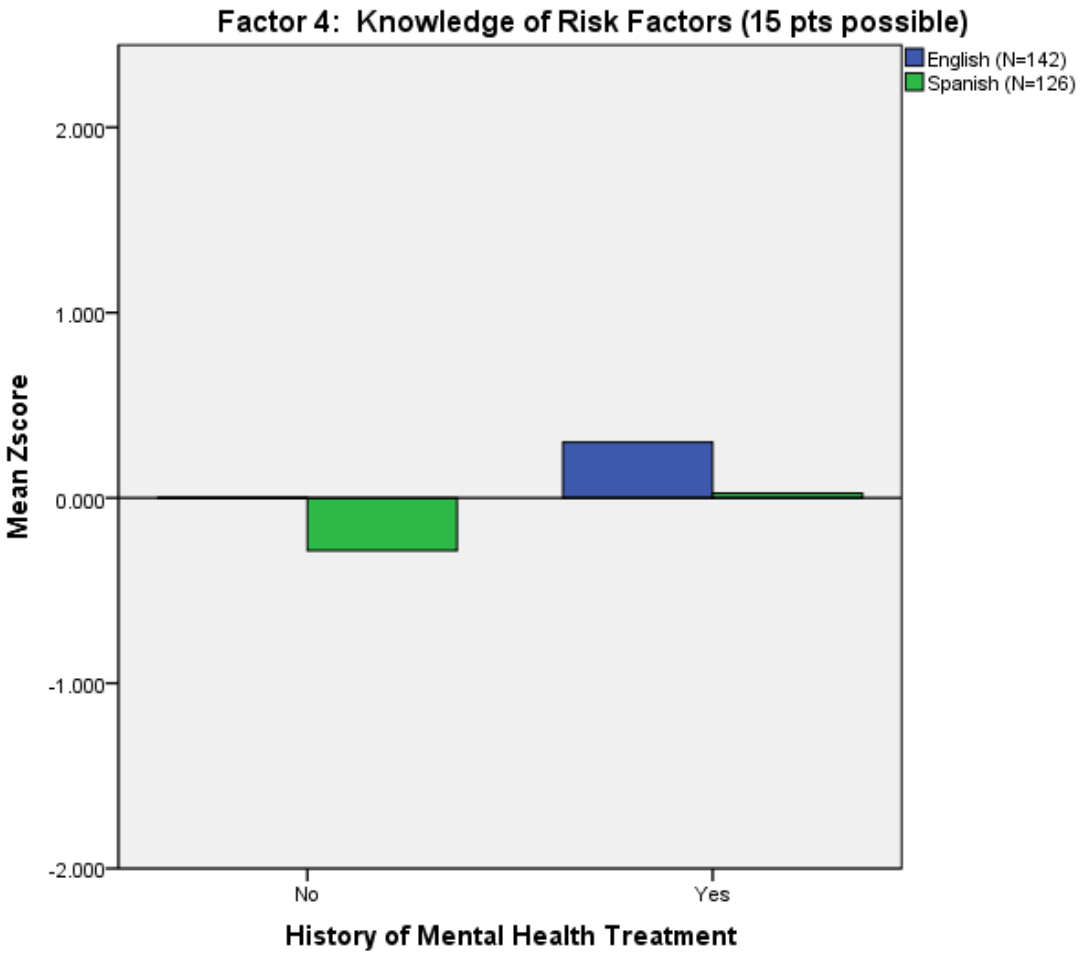

Figure 4.52 Mean Factor Z-Scores by History of MH Treatment and Language (Factor 4)

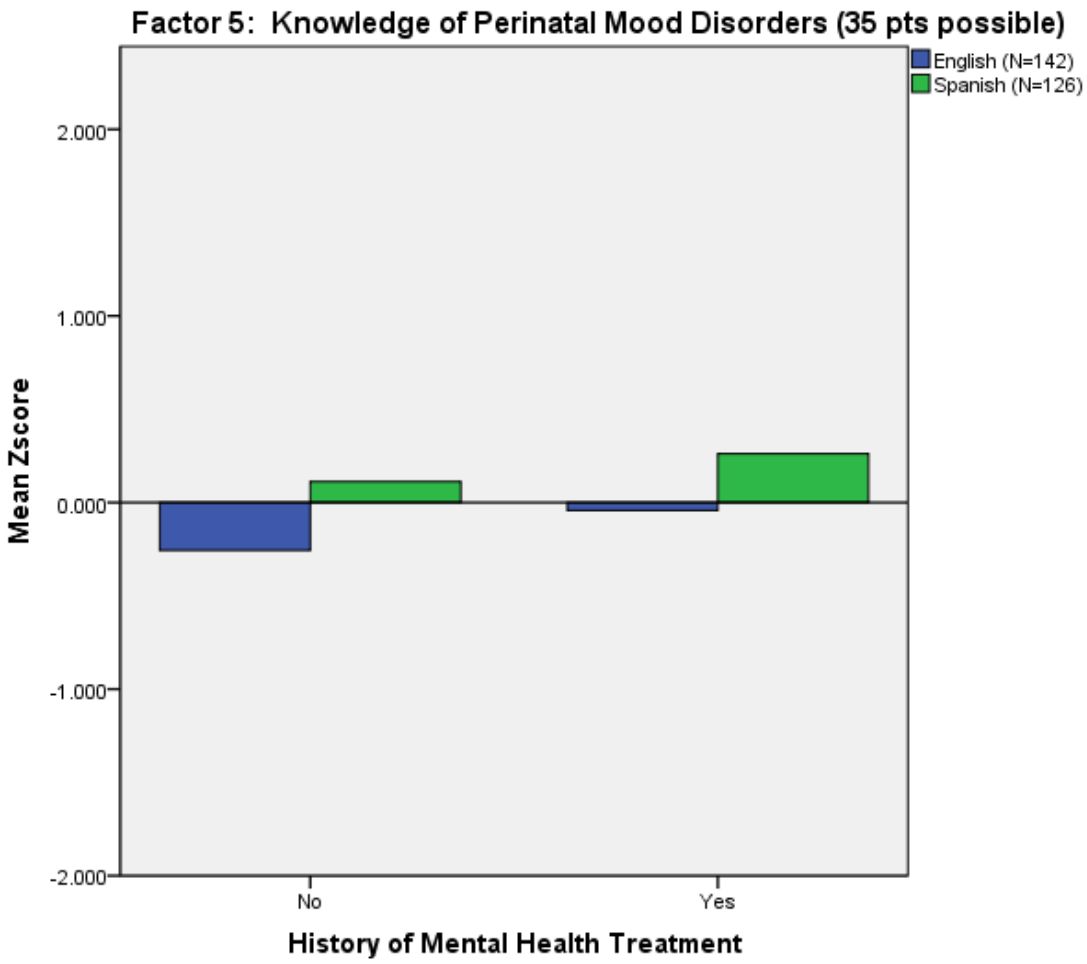

Figure 4.53 Mean Factor Z-Scores by History of MH Treatment and Language (Factor 5)

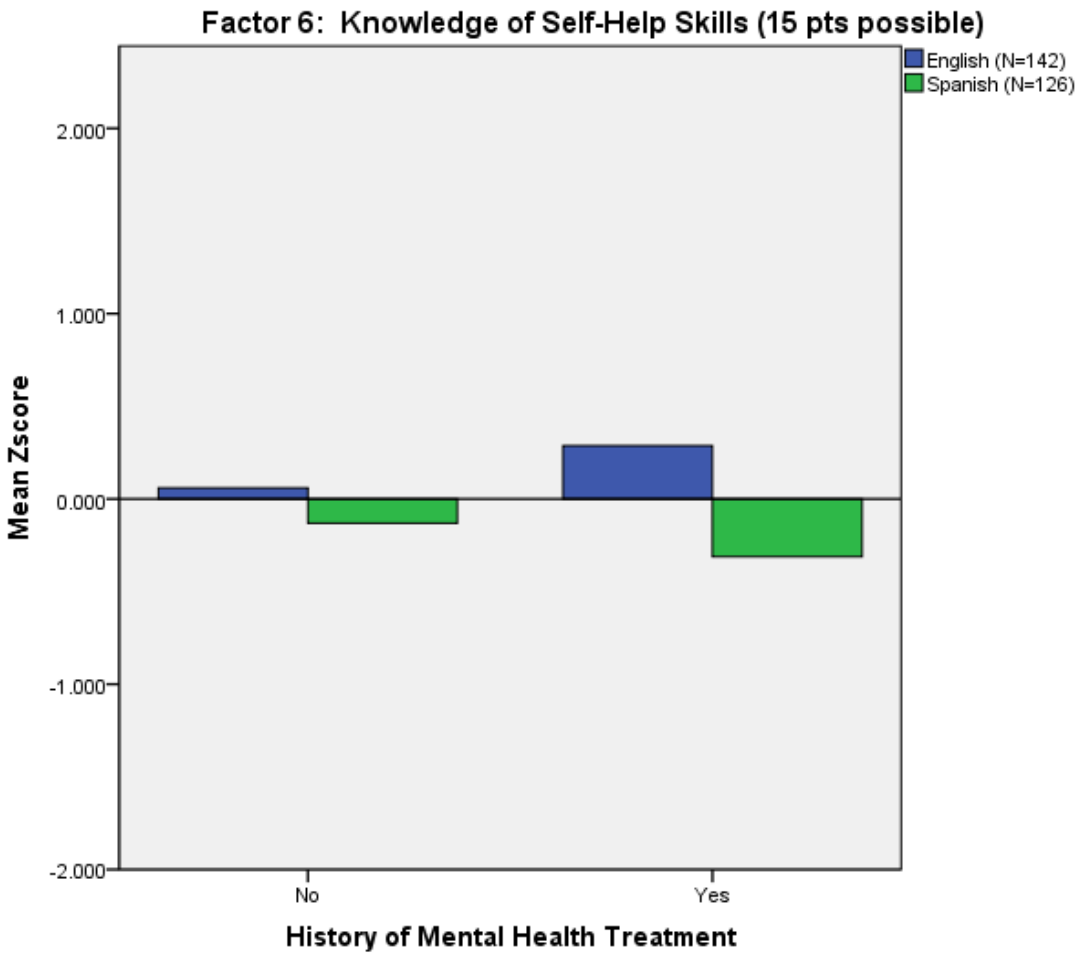

Figure 4.54 Mean Factor Z-Scores by History of MH Treatment and Language (Factor 6)

CHAPTER 5

DISCUSSION

Perinatal Mental Health Literacy in Relation to the Mental Health Literacy Framework

The development of the PMHLS, and the conceptualization of the perinatal mental health literacy construct, was strongly influenced by the work of Jorm et al. (1997), who were the first to conceptualize mental health literacy and defined it as *"the knowledge and beliefs about mental disorders which aid their recognition, management, or prevention."* In their original framework, six components exemplified mental health literacy: 1) ability to recognize specific disorders; 2) knowledge of risk factors and causes; 3) knowledge of self-treatments; 4) knowledge of how to seek mental health information; 5) knowledge of professional help available; and 6) attitudes that promoted recognition and appropriate help-seeking (Jorm et al., 1997). Researchers throughout the world have sought to measure knowledge of mental health disorders and attitudes towards help-seeking. Through the use of the vignette method, the standard protocol developed to measure mental health literacy, researchers used population-based measures to analyze trends in knowledge, attitudes, and help-seeking behaviors towards mental health disorders.

Jorm et al.'s (1997) mental health literacy framework, via the use of the vignette method, was not incorporated in mental health research being conducted in the U.S. as compared to other countries. At the turn of this century, however, U.S. researchers used other population-based measures to analyze trends in mental health knowledge, attitudes, and help-seeking behaviors. These research findings consistently demonstrated many structural barriers to care, with the greatest burden of mental illness impacting the largest racial and ethnic minority groups (U.S. DHHS, 2001; Gonzalez et al., 2010; Mojtabai et al., 2011). Still, the studies conducted focused

almost exclusively on the measurement of attitudes towards mental health disorders with minimal studies investigating the attainment of mental health knowledge or the development and application of help-seeking behaviors. Investigations of the cultural knowledge regarding mental health among different U.S. racial/ethnic groups and its effect on attitudes and help-seeking, though, were lacking. Given the burden of mental health disparities among racially, ethnically, and linguistically diverse populations in this country, it is imperative that research efforts examine the knowledge, belief systems, and help-seeking behaviors of different racial/ethnic groups to facilitate the development of evidence-based, culturally informed interventions.

Despite the growing evidence of mental health disparities among Latinos in particular, and the potential role of mental health literacy in reducing these disparities, Jorm et al.'s (1997) mental health literacy framework has rarely been applied to this population. Most of the research with Latinos, as with other U.S. racial/ethnic groups, has focused on attitudes towards mental health and much less on the attainment of knowledge or the measurement of help-seeking behaviors. The few scales developed that have measured specific components of mental health literacy with Latinos have focused on perceptions of mental illness and stigma.

This paucity of research on mental health literacy among Latinos influenced the development of the PMHLS, and in particular, the initial standardization of this scale with English and Spanish-speaking Latinas. The application of the mental health literacy framework in the development of this scale, and the standardization of the PMHLS, demonstrated that mental health literacy construct is a viable measurement tool. Furthermore, the inclusion of Hispanic, English and Spanish-speaking participants in the standardization process contributes to the small but growing literature examining mental health literacy among ethnically and linguistically diverse Latino populations.

The primary purpose of this study was to standardize a new scale, the Perinatal Mental Health Literacy Scale (PMHLS), using large, linguistically diverse samples of Hispanic women of childbearing age residing in the U.S.-Mexico border region. This chapter starts with a discussion of the major findings from the Exploratory Factor Analysis (EFA), tests of reliability, Confirmatory Factor Analysis (CFA), and tests of validity for this instrument in English and Spanish. Also included is a consideration of the items that were eliminated in each step of the factor analyses as well as a comparison of the best-fit factor model for the English and Spanish PMHLS. The construct of perinatal mental health literacy, relative to Jorm et al.'s (1997) mental health literacy framework, will then be reviewed and considered in light of the findings of this study. The chapter ends with discussions that address the research and clinical implications of the findings, limitations of the current study, and recommendations for interdisciplinary collaboration between health, public health, and mental health clinicians and researchers in addressing perinatal mental health literacy among pregnant, postpartum women, their partners, and families.

5.1 Overview of the Standardization of the PMHLS

Taken together, the results from different stages of analyses suggested that the removal of nine items from the original scale substantially improved the reliability and validity of the PMHLS while yielding scales of identical items in English and Spanish. The results further suggested that the 25-item PMHLS was a valid measure of perinatal mental health literacy among English and Spanish-speaking Hispanic females of childbearing age. The stages of scale development are considered in detail below.

Exploratory Factor Analysis (EFA) Findings – PMHLS English Scale

Before the EFA protocol (Williams, Onsman, & Brown, 2010) was applied to the English-completers data (N=269), a KMO index was calculated and Bartlett's Test of Sphericity was applied to determine whether the data were suitable for EFA. The KMO index, ranging from 0 to 1, should be at least 0.50 and Bartlett's test should be significant ($p<.05$) for the data to be considered suitable for factor analysis (Williams, Onsman, & Brown, 2010). The values for both (KMO = .769; Bartlett's test at $p < .000$) were statistically significant, together indicating that the data were suitable for EFA.

The five-step EFA indicated that a 6-factor model best explained the latent variable of perinatal mental health literacy. Principal Axis Factoring (PAF) was used to identify clusters of related items and Kaiser's criteria, Scree plot, and parallel analysis were applied to the data. When results from the application of Kaiser's criteria and Scree plot were found to differ, "parallel analysis" was conducted. Parallel analysis is a factor extraction technique whereby actual eigenvalues are compared with random order eigenvalues, and factors are retained when actual eigenvalues surpass the random order eigenvalues (Williams, Osman, & Brown, 2010). Results from this extraction approach supported the initial findings from the Scree plot, indicating that six factors were the best fit for the data. Oblique rotation was then applied to determine which variables loaded onto these six factors, demonstrating that each item in the PMHLS loaded highly onto only one factor.

In the last step of EFA, the six factors were each assigned a label based on the conceptual framework of perinatal mental health literacy research. The factors defined are shown in Table 5.1 below and compared to Jorm's mental health literacy framework.

Table 5.1 Comparison of Factors from PMHLS and Jorm et al. (1997) MHL Framework

Six Factors identified in the PMHLS	**Six Factors in Jorm's MHL Framework**
Aligned Factors	
Attitudes that facilitate help-seeking	Attitudes that promote help-seeking
Knowledge of how to find mental health resources	Knowledge of how to find mental health information
Knowledge of perinatal mood disorder risk factors	Knowledge of risk factors and causes (of psychiatric disorders)
Knowledge of perinatal mood disorders	Knowledge of psychiatric disorders
Knowledge of self-help skills	Knowledge of self-help treatments
Unaligned Factor	
Attitudes towards perinatal mood disorders	Knowledge of mental health professionals and the services they provide

As Table 5.1 shows, the factors identified in the PMHLS are very similar to five of the six categories that encompass the mental health literacy framework identified by Jorm et. al (1997). The only exception was the factor in the PMHLS labeled "attitudes towards perinatal mood disorders." The four items that encompassed this factor (see Appendix I) appeared to be tapping into stigma related to experiencing a mental health disorder during pregnancy or after childbirth. The items in this factor elicited participant's responses to negative attitudes towards help-seeking. For example, respondents were asked if they agreed that a perinatal mental health disorder was not a real medical illness, that women can control whether or not they experience mental health symptoms, and that if they did seek help, that help seeking was a sign of personal weakness.

Stigma has been extensively researched among Latinos and has been shown to be a salient barrier to accessing mental health treatment and a contributor to mental health disparities

among this group. The presence of this factor suggested that Hispanic women may also identify the stigma associated with mental health disorders during the perinatal period. This stigma may be more salient for Hispanic women given the valued role of motherhood in the culture and the perceived loss of status if seen as less than a "good" mother (Abrams, Dornig, & Curran, 2009). Also, the Latino cultural value of *familismo* (valuing family above all) dictates that a Latina mother must put the needs of her children and family above her own, suggesting that a woman should sacrifice help-seeking for her own mental health needs (Lara-Cinisomo, Clark, & Wood, 2018).

It is also of note that the factor in Jorm et. al's (1997) framework labeled "knowledge of mental health professionals and the services they provide" did not emerge in this scale. The lack of a factor that relates to knowledge of mental health professionals may be because among this Hispanic sample, no more than half of all English-completers reported any prior experience with mental health treatment.

Item Elimination. The PMHLS was originally composed of 34 items. Five items, however, were eliminated at two critical junctures in the application of EFA. For example, items were identified for elimination when they were first entered into the analysis. The correlation matrix is the initial product that provides an examination of the relationships between the individual items or variables. In factor analysis, a researcher expects to see a high number of correlations between the variables and correlations with values at or above .30. In this step, the item labeled "women with mental health disorders during pregnancy or after childbirth are a danger to themselves and to their baby" had no correlations with any other variable. The items labeled "if a person hurts him/herself, it's okay for a mental health professional to call 911" and "if a person has a mental health disorder that is not life threatening, it is okay for a mental health

professional to tell family or friends" each had only one weak correlation. These three items were borrowed and modified for perinatal women from the Mental Health Literacy Scale (MHLS) developed by O'Connor & Casey (2015) in Australia (email communication with Dr. O'Connor, August 2018). The findings suggested that those items were not related to other items in the scale and thus were not measuring any aspect of the perinatal mental health literacy construct, particularly among this Hispanic sample of English completers.

The second time that items were identified for removal occurred after the results of parallel analysis indicated that six factors should be retained for the model. Factor extraction using PAF was conducted forcing six factors for extraction, and the first output provided was a table of communalities that indicated the amount of shared variance explained by the factor solution. Correlations above .30 indicated that an item shared significant variance with other items. In this process, two items had correlations below .30. The item "interpersonal therapy would be helpful for women who experience anxiety or depression during pregnancy or after childbirth" (r = .245) and the item "cognitive behavioral therapy would be helpful for women who experience anxiety or depression during pregnancy or after childbirth" (r = .176) both had correlations below the suggested cutoff. These two items were developed based on the perinatal mental health research identifying them as the best evidence-based treatments for perinatal depression and anxiety. Still, the items did not share enough variance with other items and were removed from further analyses. These findings indicated that participants were not familiar with the types of therapeutic approaches applicable to the treatment of perinatal mood disorders. Thus, the items may not be measuring any aspect of the perinatal mental health literacy among this Hispanic sample.

Reliability of the PMHLS (English)

The 29 items in the 6-factor model that best explained perinatal mental health literacy were assessed for reliability by examining Cronbach's Alpha measures of internal consistency and item total correlations. Reliability analyses for four out of the six factors provided conclusive results regarding the reliability of those factors (Cronbach's Alpha values ranged from $\alpha = .763$ to .823). Item total correlations within each factor were all above .40 ($r = .459$ to .834), suggesting that items within each factor were measuring the same construct and that the individual items correlated well with the overall scale.

Item Elimination. Initial reliability statistics for two of the six factors, namely Knowledge of Self-Help Skills (Factor 3) and Knowledge of How to Find Mental Health Resources (Factor 4) suggested that an individual item in each of these factors needed to be deleted in order to improve the value of Cronbach's Alpha. For example, the item in Factor #3 labeled "to avoid situations that make her feel anxious or depressed" contributed to a low alpha for this factor ($\alpha = .185$). The poor reliability may have been due to confusion from the item's reverse-wording. Removal of this item greatly improved the Cronbach's Alpha (from $\alpha = .185$ to $\alpha = .886$) for the remaining three items in the factor.

The removal of the item in Factor #4 labeled "I know where to get information about mental health disorders in the community where I live" was suggested by the item having an individual Cronbach's Alpha measure that was higher than the measure for the overall factor, indicating item redundancy. Removal of this item, leaving four items in this factor, improved the Cronbach's Alpha (from $\alpha = .805$ to $\alpha = .814$). In conclusion, the English-language PMHLS 6-factor model, consisting of 27 items, was found to best explain the perinatal mental health literacy construct among English-language survey completers.

Exploratory Factor Analysis (EFA) Findings – PMHLS Spanish Scale

All of the steps conducted for the English-completers were followed for the Spanish-completers. Thus, before the EFA protocol (Williams, Onsman, & Brown, 2010) was applied to the Spanish-completers data (N=260), a KMO index was calculated to determine whether the data were suitable for EFA, and Bartlett's Test of Sphericity was applied. The values for both (KMO = .845; Bartlett's test at $p < .000$) were statistically significant, together indicating that the data were suitable for EFA.

Also similar to the English-completers data, the five-step EFA indicated that a 6-factor model best explained the latent variable of perinatal mental health literacy among this sample. Principal Axis Factoring (PAF) was used to identify clusters of related items and Kaiser's criteria, Scree plot, and parallel analysis were applied to the data. Results from the application of Kaiser's criteria and Scree plot both suggested the extraction of six factors. Parallel analysis was conducted to confirm these findings and resulted in a comparison of a seven versus six factor model to determine best fit. In this process, the forced extraction of seven factors demonstrated that only six factors had eigenvalues greater than 1, suggesting that six factors were the best fit for the data. Oblique rotation was then applied to determine which variables loaded onto these six factors, demonstrating that each item in the PMHLS loaded highly onto only one factor.

In the last step of EFA, the six factors were each assigned a label based on the conceptual framework of perinatal mental health literacy research. The factors in the Spanish-language PMHLS were identical to those that were identified in the English version, suggesting that the two scales were measuring the same construct. The factors identified are shown in Table 5.2 below and compared to Jorm et. al's (1997) mental health literacy framework.

Table 5.2 Comparison of Factors from PMHLS and Jorm et al. (1997) MHL Framework

Six Factors identified in the PMHLS	**Six Factors in Jorm's MHL Framework**
Aligned Factors	
Attitudes that facilitate help-seeking	Attitudes that promote help-seeking
Knowledge of how to find mental health resources	Knowledge of how to find mental health information
Knowledge of perinatal mood disorder risk factors	Knowledge of risk factors and causes (of psychiatric disorders)
Knowledge of perinatal mood disorders	Knowledge of psychiatric disorders
Knowledge of self-help skills	Knowledge of self-help treatments
Unaligned Factor	
Attitudes towards perinatal mood disorders	Knowledge of mental health professionals and the services they provide

Table 5.2 shows, as in the English-completers version, that the factors identified in the PMHLS are very similar to five of the six categories that encompass the mental health literacy framework identified by Jorm et. al (1997). The only exception was the factor identified in the PMHLS labeled "Attitudes towards perinatal mood disorders." As with the results of the English PMHLS, the four items that encompassed this factor appeared to be tapping into stigma related to experiencing a mental health disorder during pregnancy or after childbirth (see page 160 above). The development of this factor suggested that Hispanic women identified the stigma associated with mental health disorders during the perinatal period. This stigma may be more salient for Hispanic women given the valued role of motherhood in the culture and the perceived loss of status if a woman acknowledges or seeks treatment for a perinatal mood disorder. On the other hand, the factor in Jorm et. al's (1997) framework labeled "Knowledge of mental health professionals and the services they provide" was not created in this scale. The lack of a factor

that relates to knowledge of mental health professionals may be because among this Hispanic sample, no more than a third of all Spanish completers reported any prior experience with mental health treatment.

Item Elimination. The PMHLS was originally composed of 34 items. Four items, however, were eliminated at two critical junctures in the application of EFA to the Spanish dataset. In the first instance, three items were identified for elimination during review of the correlation matrix. The correlation matrix is the initial product that provides an examination of the relationships between the individual variables. In factor analysis, a researcher expects to see a high number of correlations between the variables and correlations with values at or above .30. The item labeled "women with mental health disorders during pregnancy or after childbirth are a danger to themselves and to their baby" had no correlations with any other variable. The items labeled "mental health disorders during pregnancy or after childbirth are not a real medical illness" (r = .308) and "if a person has a mental health disorder that is not life threatening, it is okay for a mental health professional to tell family or friends" (r = .317) each had only one weak correlation with another variable. As with the English PMHLS, these three items were borrowed and modified for perinatal women from the Mental Health Literacy Scale (MHLS) developed by O'Connor & Casey (2015). The findings suggested that those items were not related to other items in the scale and thus were not measuring any aspect of the perinatal mental health literacy construct, particularly among this Hispanic sample of Spanish completers.

One more item was identified for removal during the first round of factor extraction using PAF. A table of communalities, correlations that represent the amount of shared variance explained by the factors, was generated after running this analysis. A correlation below .30 signaled that an item did not share enough variance with other items. In this step, the item

labeled "if a person hurts him/herself, it is okay for a mental health professional to call 911" (r = .201) had a correlation below the suggested cutoff and was removed from further statistical analyses. As with the previous items that were borrowed and modified for perinatal women from the Mental Health Literacy Scale (2015), the findings indicated that this item was not related to other items in the scale and was not measuring any aspect of the perinatal mental health literacy construct among this sample.

Reliability of the PMHLS (Spanish)

The 30 items in the 6-factor model that best explained perinatal mental health literacy among Spanish-completers were assessed for reliability by examining Cronbach's Alpha measures of internal consistency and their item total correlations. Reliability analyses for four out of the six factors provided conclusive results regarding the reliability of those factors (Cronbach's Alpha values ranged from α = .627 to .907). Item total correlations within each factor fell within acceptable values (r = .387 to .904), suggesting that items within each factor were measuring the same construct and individual items correlated well with the overall scale.

Item Elimination. Initial reliability statistics for two of the six factors, namely Knowledge of Self-Help Skills (Factor 3) and Knowledge of How to Find Mental Health Resources (Factor 4) suggested that an individual item in each of these factors needed to be deleted in order to improve the value of Cronbach's Alpha. These recommendations for deletion of the same items were also noted in the English version of the PMHLS. For example, the item in Factor 3 labeled "to avoid situations that make her feel anxious or depressed" contributed to a low alpha for this factor. The poor reliability may have been due to confusion from the reverse-wording of the item. Removal of this item greatly improved the Cronbach's Alpha (from α = .107 to .949) for the remaining three items in the factor.

The removal of the item in Factor 4 labeled "I know where to get information about mental health disorders in the community where I live" was suggested by the item having an individual Cronbach's Alpha measure that was higher than the measure for the overall factor, implying item redundancy. Removal of this item, leaving four items in this factor, improved the Cronbach's Alpha (from $\alpha = .843$ to .854). In conclusion, the Spanish-language PMHLS 6-factor model, consisting of 28 items, was found to best explain the perinatal mental health literacy construct among Spanish-language survey completers.

Comparisons of EFA Results for PMHLS English and Spanish Scale

The EFA results for the English and Spanish versions of the PMHLS were very similar. In both, a six-factor model best described the construct of perinatal mental health literacy, with each version identifying the same number and type of factors. The analyses for both scale versions identified the removal of the same five items. Slight differences, though, emerged with regard to the number of items representing the 6-factor model in both scales, specifically with regard to the composition of Factor 1 (Knowledge of Perinatal Mood Disorders) and Factor 5 (Attitudes toward Perinatal Mood Disorders). In the English PMHLS, Factor 1 consisted of seven items, while in the Spanish version this factor consisted of nine items. Also, four items encompassed Factor 5 in the English scale, while this factor in the Spanish PMHLS consisted of only three items. As a result, the 6-factor model identified as the best fit for the data was generated by 27 items from the PMHLS English version versus 28 items from the Spanish version. Tables 5.3 and 5.4 below compares the differences in these factors.

Table 5.3 PMHLS Factor 1 (Knowledge of Perinatal Mood Disorders) Comparisons

Factor 1 – Scale Items (English)	**Factor 1 – Scale Items (Spanish)**
Aligned Factors	
If the woman feels very nervous, worries about many things, including her baby, and finds it difficult to control the worry, she has a medical condition called **"**Anxiety Disorder".	If the woman feels very nervous, worries about many things, including her baby, and finds it difficult to control the worry, she has a medical condition called **"**Anxiety Disorder".
If the woman feels sad/depressed some days but is very 'hyperactive' on other days and does not sleep, she has a medical condition called "Bipolar Disorder".	If the woman feels sad/depressed some days but is very 'hyperactive' on other days and does not sleep, she has a medical condition called "Bipolar Disorder".
If the woman experiences or witnesses a traumatic event, has upsetting memories of the event, and avoids anything that reminds her of that event, she has a medical condition called "Trauma & Stressor-Related Disorder".	If the woman experiences or witnesses a traumatic event, has upsetting memories of the event, and avoids anything that reminds her of that event, she has a medical condition called "Trauma & Stressor-Related Disorder".
If the woman has lost interest in her normal activities and feels sad nearly every day for more than two weeks, she has a medical condition called "Major Depressive Disorder".	If the woman has lost interest in her normal activities and feels sad nearly every day for more than two weeks, she has a medical condition called "Major Depressive Disorder".
If the woman has persistent, fearful thoughts and tries to control them by doing repetitive behaviors such as excessively cleaning or checking on the baby, she has a medical condition called "Obsessive-Compulsive Disorder".	If the woman has persistent, fearful thoughts and tries to control them by doing repetitive behaviors such as excessively cleaning or checking on the baby, she has a medical condition called "Obsessive-Compulsive Disorder".
If the woman, within the first few days or weeks after childbirth, cannot sleep at all, has severe mood changes, and has thoughts about hurting herself or her baby, she has a medical condition called **"**Brief Psychotic Disorder".	If the woman, within the first few days or weeks after childbirth, cannot sleep at all, has severe mood changes, and has thoughts about hurting herself or her baby, she has a medical condition called **"**Brief Psychotic Disorder".
If the woman, within a few days after childbirth, feels irritable or cries frequently but says these feelings go away, she is experiencing a common condition called "postpartum baby blues".	If the woman, within a few days after childbirth, feels irritable or cries frequently but says these feelings go away, she is experiencing a common condition called "postpartum baby blues".

Factor 1 – Scale Items (English)	Factor 1 – Scale Items (Spanish)
Unaligned Factors	
	Interpersonal Therapy helps people improve their relationships with others. This therapy would be helpful for women who experience anxiety or depression during pregnancy or after childbirth.
	Cognitive Behavioral Therapy helps people change their negative thoughts and behaviors. This therapy would be helpful for women who experience anxiety or depression during pregnancy or after childbirth.

Table 5.4 PMHLS Factor 5 (Attitudes towards Perinatal Mood Disorders) Comparisons

Factor 5 – Scale Items (English)	Factor 5 – Scale Items (Spanish)
Aligned Factors	
A mental health disorder during pregnancy or after childbirth is a sign of personal weakness.	A mental health disorder during pregnancy or after childbirth is a sign of personal weakness.
Seeing a mental health professional during pregnancy or after childbirth shows that a woman is not strong enough to manage her own problems.	Seeing a mental health professional during pregnancy or after childbirth shows that a woman is not strong enough to manage her own problems.
Women with mental health disorders during pregnancy or after childbirth could "snap out of it" if they wanted.	Women with mental health disorders during pregnancy or after childbirth could "snap out of it" if they wanted.
Unaligned Factors	
A mental health disorder during pregnancy or after childbirth is not a real medical illness.	

Three items represented the difference in the total number of items in the PMHLS, with Factor 1 consisting of seven versus nine items and Factor 5 consisting of four versus three items in the English and Spanish scales, respectively. For instance, the item in Factor 1 labeled

"interpersonal therapy helps people improve their relationships with others" loaded high in the Spanish scale but was removed from the English scale due to having a low correlation with other variables. Another item in Factor 1 labeled "cognitive behavioral therapy helps people change their negative thoughts and behaviors" also loaded high in the Spanish scale but was removed from the English scale due to having a low correlation with other variables. Lastly, an item in Factor 5 labeled "a mental health disorder during pregnancy or after childbirth is not a real medical illness" loaded high in the English scale but was removed from the Spanish scale due to having a weak correlation with other variables in the initial correlation matrix.

Given the major similarities between the English and Spanish versions of the PMHLS, a decision was made to adjust the scale items such that the items of the English and Spanish versions exactly matched. After examining the three problematic items shown above, it was decided that the two items in Factor 1 referenced above be removed from the Spanish scale, leaving the factor with seven items, which matched the number of items in the PMHLS English version for that factor. Thus, the remaining items in this factor would only elicit knowledge of the most prevalent perinatal mood disorders. Also, a decision was made to add the third item referenced above back to Factor 5 in the Spanish version. In preparation for the Confirmatory Factor Analysis (CFA) stage, the last item was re-worded as a positive (rather than negative) statement. This item was thus re-written in both versions of the revised PMHLS as "a mental health disorder during pregnancy or after childbirth is a real medical illness."

In view of the removal of two items and the inclusion of another item to the Spanish PMHLS, EFA was conducted again with this 27-item dataset. EFA using PAF and oblique rotation indicated minimal changes to the adequacy of the sample, total variance, factor loadings, and overall structure of the 6-factor model. Measures of reliability were maintained for Factor 1

(7 items, α = .907), and increased slightly for Factor 5 (4 items, α = .636) in the Spanish scale. At this point, the resulting English and Spanish versions of the PMHLS had 27 identical items and based on EFA findings, a 6-factor solution continued to produce the best data fit for both scales.

Comparisons of Reliability Results for the PMHLS English and Spanish Scale

Reliability analyses of the two scales were compared to determine the strength of the reliability of each of the six factors. Overall, the six factors in the English and Spanish PMHLS demonstrated strong Cronbach's Alpha values, with the Spanish scale being somewhat stronger than the English scale as shown in Table 5.5 below.

Table 5.5 PMHLS Reliability Statistics Comparisons

Cronbach Alpha Values (English)	**Cronbach Alpha Values (Spanish)**
Factor 1: α = .820	Factor 1: α = .907
Factor 2: α = .823	Factor 2: α = .822
Factor 3: α = .886	Factor 3: α = .949
Factor 4: α = .814	Factor 4: α = .854
Factor 5: α = .763	Factor 5: α = .636
Factor 6: α = .800	Factor 6: α = .902

As shown in the English version, the Cronbach's Alpha values for Factors 1, 2, and 6 (α =.800 to α =.823), were slightly smaller compared to the Alpha values for these same factors in the Spanish scale (α =.822 to α =.907). Modifications to Factors 3 and 4 in both scales, resulting in the removal of the same item in each factor, improved factor reliability more for the Spanish than the English scale. Specifically, the Cronbach's Alpha measure for Factor 3 in the Spanish

scale had a higher value (α = .949) compared to the English scale (α = .886). Likewise, removal of the same item from Factor 4 improved reliability at a slightly higher Cronbach's Alpha value in the Spanish scale (α = .854) compared to the English scale (α = .814).

Factor 5 (Attitudes towards perinatal mood disorders), had the lowest reliability in both scales, with the English scale having a slightly better Cronbach's Alpha (α = .763) as compared to the Spanish scale (α = .636). Item total correlations for the English scale (*r* = .479 to .645) also had a slightly higher range of values as compared to the Spanish scale (*r* = .387 to .486). Factor 5 included an item that loaded high in the English scale and remained in the factor but was removed from the Spanish scale due to having a weak correlation with other variables in the correlation matrix.

Adding this item back into the Spanish scale provided a small improvement in the Cronbach's Alpha (from α = .627 to α = .636). It was anticipated that wording this item in the positive (e.g. "a mental health disorder during pregnancy or after childbirth is a real medical illness") would help to increase factor reliability in the confirmatory phase of data collection. Continued low measures of internal consistency for this factor, particularly for the Spanish scale, may suggest the need for the development and testing of new items with focus groups prior to further validation studies. A review of validated stigma scales that have been standardized with Latinos may also provide an important resource for accessing similar items and may thus contribute to the improvement of the reliability of this factor.

Confirmatory Factor Analysis (CFA) Findings – PMHLS English Scale

CFA was conducted on data collected in the validation phase (N = 268) to determine if the hypothesized 6-factor model identified by EFA was a good fit for the data and thus a valid measure of the perinatal mental health literacy construct. First, the factor model identified in EFA for the English PMHLS was tested using CFA with a different population (N = 142). The four model fit indexes that were tested included the Chi-square statistic (x^2), the Comparative Fit Index (CFI), the Tucker Lewis Index (TLI), and the Root Mean Square Error of Approximation (RMSEA) (Shek & Yu, 2014). The Chi square statistic, an absolute fit index, tests how well a hypothesized model fits the data; its associated p-value should not be significant if there is good model fit. The Chi-square, however, is sensitive to sample size and thus the CFI, TLI, RMSEA, and other measures are recommended when examining model fit (Shek & Yu, 2014).

CFA results from the PMHLS English dataset showed that there was an insufficient fit to the model as demonstrated by four fit indexes (x^2=487.81, p<.000; CFI = .852; TLI=.832; and RMSEA=.064), primarily due to the significant p-value for the chi-square and not meeting criteria for the other indexes. Table 5.6 demonstrates the model fit statistics for the CFA models using the revised PMHLS English-language dataset (N=142).

Table 5.6 *Goodness of Fit Statistics for the Modified Primary-Order CFA Models*

Model	Modification	x^2	Df	CFI	TLI	RMSEA
MO	Original model	487.81	309	0.85	0.83	0.06
M1	MO, correlated errors u8 & u9	412.90	308	0.91	0.90	0.05
M2	M1, correlated errors u9 & u10	401.05	307	0.92	0.91	0.05
M3	M2, deletion of items 9 & 10	321.70	260	0.94	0.93	0.04
Criterion for goodness of fit		-	-	≥0.95	≥0.95	≤0.05

Modification indices including the co-variances were examined to determine how model fit could be improved. Improvement to the model required adding correlations between error terms and removal of PMHLS items 9 and 10 owing to their low factor loadings and high correlations of their error terms. As stated previously, items 9 and 10 required the reader to respond to experiences far removed from their own (e.g. their perception of whether or not another person would ask for professional help for a mental health disorder). Participants may have given the same responses to these items as to those that related to their own experiences with help-seeking, thereby weakening the items, and therefore their removal from the scale seemed warranted.

After these modifications were implemented, model fit improved sufficiently (x^2=321.70, p<.000; CFI = .94; TLI=.93; and RMSEA=.04, CI .023 - .055). The significant chi-square statistic was largely due to the relatively large sample size (Shek & Yu, 2014); improvements in the other model fit statistics were considered sufficient to conclude that the item adjustments produced adequate model fit. Results from the CFI, TLI, and RMSEA model fit indexes showed that a 6-factor model, composed now of 25 items in the English PMHLS, was a good fit for the perinatal mental health literacy construct.

Confirmatory Factor Analysis (CFA) Findings – PMHLS Spanish Scale

The factor model identified in EFA for the Spanish PMHLS was also tested using CFA with a different population (N = 126) to test the construct validity of the PMHLS in Spanish, and to confirm the factor structure. Similar to the English version, CFA results from the PMHLS Spanish dataset also showed that the data were an insufficient fit to the model as demonstrated by four commonly referenced fit indexes (x^2=518.61, p<.000; CFI = .884; TLI=.868; and RMSEA=.074). Table 5.7 provides the model fit statistics for the CFA models using the revised

PMHLS Spanish dataset (N=126).

Table 5.7 *Goodness of Fit Statistics for the Modified Primary-Order CFA Models*

Model	Modification	x^2	Df	CFI	TLI	RMSEA
MO	Original model	518.61	309	0.88	0.87	0.07
M1	MO, correlated errors u8 & u9	488.20	308	0.90	0.89	0.07
M2	M1, deletion of items 9 and 10	366.38	260	0.93	0.92	0.06
M3	M2, correlated errors u20 & u23	340.44	259	0.95	0.94	0.05
Criterion for goodness of fit		-	-	≥0.95	≥0.95	≤0.05

Modification indices such as co-variances were examined to determine areas where model fit could be improved. These indices showed that the error terms for items 8 and 9 were highly correlated, a similar finding noted in the CFA for the English dataset. However, correlating the error terms for these items did not greatly improve model fit. Also, a high correlation between error terms for items 9 and 10 was also noted. Given that CFA results of the English factor model suggested the removal of items 9 and 10 as a result of the high inter-correlations of their error terms, those same items were removed in this analysis to improve model fit. Lastly, modification indices also proposed correlating the error terms for items 20 and 23. After these modifications were implemented, model fit was greatly improved (x^2=340.44, p<.000; CFI = .95; TLI=.94; and RMSEA=.050, CI .034 - .064). Results from the CFI, TLI, and RMSEA model fit indexes showed that a 6-factor model, composed now of 25 items in the Spanish PMHLS, was a good fit for the perinatal mental health literacy construct.

Comparisons of CFA Results for the PMHLS English and Spanish Scale

CFA conducted with English and Spanish-language completers suggested that the 27-item, 6-factor model originally identified in EFA required further tightening in order to improve model fit. Specifically, the removal of the same two items in both the English and Spanish versions of the PMHLS was needed. The items identified for removal from both versions were "If someone I know and love had a mental health disorder, he or she would seek professional help" and "People that I know and love believe that mental health treatment would be effective." In each of these items, the reader was being asked to base their response on what they believed another person would do with regard to seeking help for mental health issues. These questions required responses based on experiences far removed from their own, and in retrospect, it seemed unlikely that a respondent could have actually known what another person would do in the described situation. In the absence of knowledge, participants may have simply given the same responses to these items as to those that related to their own experiences with help-seeking. This type of guessing might be expected to impact the reliability of the factor items related to help-seeking. It was also noted during the exploratory phase of the data collection that less than half of English-completers and less than a third of Spanish-completers reported a history of mental health treatment for themselves or a family member. This lack of contact with the mental health system itself may have also impacted participant responses to these items if there were very few opportunities for accessing mental health treatment.

Tests of Validity

Three tests were applied to the data collected in the exploratory and confirmatory phases to determine the validity of the English and Spanish PMHLS. Known-groups validity is a statistical measure of difference between two groups; in this study, independent sample t-tests

were conducted to determine if there were significant differences between the PMHLS scores of participants who reported a history of them or a family member receiving some sort of mental health treatment versus those who did not. Among Hispanic females who completed the PMHLS in the EFA phase (N=529), there were significant differences between those that did report history of mental health treatment versus those that did not (effect size of $d = .52$). The size of this group difference suggested that there was a strong relationship between PMHLS scores and history of mental health treatment.

Similarly, Hispanic participants who completed the revised PMHLS in the confirmatory phase (N=268), and who reported a history of mental health treatment for themselves or a family member, had significantly higher PMHLS scores as compared to those who did not report such history (effect size of $d = .46$), confirming the strong relationship between PMHLS scores and history of mental health treatment among a different Hispanic female sample.

Convergent validity was the second test of validity applied to the data collected in the confirmatory phase. Convergent validity is a test of the extent to which constructs that are conceptually related are quantitatively similar. Scores on the help-seeking subscale in the revised PMHLS (Factor 2) were compared to scores on the General Help Seeking Questionnaire (GHSQ). Among English-completers, the total score on Factor 2 of the revised PMHLS was shown to be significantly positively correlated with the GHSQ (r (139) = .402, two-tailed, $p < .000$). Among Spanish-completers, the total score on Factor 2 of the revised PMHLS was significantly positively correlated with the GHSQ (r (122) = .317, two-tailed, $p < .000$).

Results of these correlational tests suggested that the factor in the PMHLS related to help-seeking and the GHSQ were measuring the same construct of help-seeking, supporting the validity of the PMHLS in both languages. At the same time, the correlation was not so high as to

suggest that the scales were completely redundant and tapping the same underlying construct. The PMHLS appeared to be measuring other important aspects of perinatal mental health literacy, and in particular, how Hispanic female participants view and act towards help-seeking.

Lastly, scores on the revised PMHLS were compared to scores on the Kessler Scale to demonstrate evidence of discriminant validity. Discriminant validity is a test of the extent to which measures that are conceptually unrelated are in fact dissimilar. Results of these analyses showed that there was no significant relationship between PMHLS scores and the Kessler scores (r (142) = .092, two-tailed, p = .278), among English-completers. Furthermore, there was no significant relationship between PMHLS scores and Kessler scores (r (126) = .071, two-tailed, p = .431), among Spanish-completers. Results of these correlational tests suggested that the PMHLS and the Kessler Scale were measuring two different constructs, such that levels of current psychological distress were not related to levels of perinatal mental health literacy, thereby providing evidence of discriminant validity of the PMHLS.

In conclusion, results from these three tests demonstrated strong, consistent evidence for the construct validity of the PMLHS, indicating that the revised PMHLS was a valid measure of perinatal mental health literacy for English and Spanish-speaking Latinas of childbearing age.

Prediction of Perinatal Mental Health Literacy by Demographic Variables

A second exploratory goal of the present study was to gather preliminary data regarding which demographic variables predicted perinatal mental health literacy among the exploratory and confirmatory study samples, using the final 25-item PMHLS. Multiple linear regression analyses examined whether a participant's level of education, income, and/or previous history of mental health treatment predicted perinatal mental health literacy among samples of Hispanic,

English and Spanish completers. In these analyses, income was not found to be a predictor of perinatal mental health literacy. Education and a history of mental health treatment were found to significantly predict perinatal mental health history, however, the effect size for each association was low (d = .05, .10 respectively). This finding suggested that the results were in fact not practically meaningful, the statistical significance being attributable only to the relatively large sample sizes.

To identify possible patterns of knowledge and attitudes, the means and standard deviations of PMHLS scores across these demographic subgroups were compared. Individual factor scores were then converted to Z-scores to facilitate the identification of scoring patterns among English and Spanish completers across varied levels of education and history of mental health treatment.

Evaluation of Means and Standard Deviations of PMHLS Total Scores

Given the low association between perinatal mental health literacy and education, the means and standard deviations of PMHLS scores across different levels of education and language of survey completion were analyzed to consider possible scoring patterns (refer to Tables 4.23 in Results section).

It may be important to note that in this study of Hispanic women, data from English and Spanish surveys reflect the language of choice in a sample that was primarily bilingual (see pages 91 and 120, Tables 4.1 and 4.16). Interestingly, the 4-item Brief Acculturation Scale for Hispanics (BASH) revealed that a large majority of participants had equal preference with regard to usage for both English and Spanish. Thus, the language chosen for completion of the PMHLS may have reflected the participants personal identification with the language and culture

selected. By extension, the choice of the Spanish language version may have captured participants who are more closely associated with the values of the Hispanic (predominantly Mexican) culture. This will be considered below as the patterns of results are summarized.

In the data collected during the exploratory phase (N=529), the lowest mean PMHLS score and highest range of the standard deviation was among Spanish completers with less than a high school education. However, the difference in the range of mean scores across the other levels of education was less than four points. In the confirmatory phase (N=268) (Table 4.24 in Results section), the largest difference was in the mean PMHLS total scores of English completers (M = 92.38) as compared to Spanish completers (M = 85.32) with a high school education. The point differences in scores, though, were much smaller between English and Spanish completers across other levels of education. In addition, Spanish completers had higher PMHLS total mean scores as compared to English completers who had attained a college degree.

PMHLS total mean scores, in relation to reported history of mental health treatment and language of survey completion, were also analyzed (see Table 4.25). Among the data collected in the exploratory factor analysis phase, English and Spanish completers alike who reported no history of mental health treatment obtained lower mean PMHLS total scores as compared to the groups of women who did report such history. The mean score differences within the language groups that did report the same type of mental health history (yes/no), though, were very minimal. Comparisons with the data collected in the confirmatory phase (see Table 4.26) yielded similar results. Participants who completed the PMHLS in either language, and who reported no history of mental health treatment, had a lower mean PMHLS total score as compared to those who reported such history. The within group differences in scores between those who did report a history of mental health treatment and those that did not were very small.

With regard to the patterns in PMHLS mean scores for the variables of education, history of mental health treatment, and language, the scoring patterns were unremarkable. Mean scores were similar across the demographic variables, with different groups of women demonstrating slightly higher mean PMHLS scores. As was referenced in the results of the exploratory multiple regression analyses, these demographic variables seemed to have had no meaningful impact on the attainment of perinatal mental health literacy among Hispanic women who completed the scale in either language. Designed studies are needed to experimentally test the extent to which level of education, history of interaction with mental health providers, and/or acculturation are associated with perinatal mental health literacy among Hispanic women. The findings will be critical for understanding how to design effective intervention programs.

Evaluation of the Individual Factor Z-Scores

Exploratory analysis of individual factor scores was also conducted to assess the potential impacts of the demographic variables on perinatal mental health literacy. Any patterns in scoring identified may provide valuable information that can be used for designing future experimental studies that will eventually guide the development of targeted interventions for increasing knowledge of and improving attitudes towards perinatal mental health.

To assess patterns of perinatal mental health literacy, factor scores were transformed to z-scores for the final 25-item PMHLS. Individual graphs showed the relationships between PMHLS factor z-scores, level of education, history of mental health treatment, and language survey was completed (Results, pages 132-155, Figures 4.31 to 4.54). PMHLS scoring patterns across levels of education were assessed by comparing individual factor z-scores from both the exploratory and confirmatory data.

Considering the mean factor z-scores across levels of education, English and Spanish-completers both had average z-scores below the mean for each of the six factors at the five different levels of education. However, some visible differences between English and Spanish-language completers were noted in scores within specific factors. For example, the lowest mean PMHLS z-scores, close to one standard deviation (SD) below the mean, were found in Factor 1 (Attitudes towards Perinatal Mood Disorders) and in Factor 6 (Knowledge of Self-Help Skills). In Factor 1, Spanish-completers across varied levels of education had PMHLS scores below the mean. Spanish and English-completers, specifically those with less than a high school education, both had PMHLS mean scores at approximately one SD below the mean. In Factor 6, English-completers with less than a high school education had PMHLS mean scores just past 1 SD below the mean, representing the group with the lowest scores for this factor. In addition, Spanish-completers in both the exploratory and confirmatory phase also received low PMHLS mean scores across the varied levels of education for Factor 6. The other visible response pattern involved Factor 2 (Attitudes that Facilitate Help-Seeking), whereby only English-completers across the varied levels of education consistently had PMHLS scores below the mean.

The last examination of pattern responses assessed the relationships between PMHLS scores, previous history of mental health treatment, and language of survey completion. In these analyses, the lowest mean PMHLS z-scores in both the exploratory and confirmatory data were noted in Factor 1 (Attitudes towards Perinatal Mood Disorders), particularly among Spanish completers who reported no history of mental health treatment. Interestingly, Spanish completers that did report a history of mental health treatment also had PMHLS mean scores that were below the mean. With regard to Factor 2 (Attitudes that Facilitate Help-Seeking), English completers with or without any history of mental health treatment had the lowest PMHLS mean

scores across both datasets. In Factor 3 (Knowledge of How to Find Mental Health Resources), English and Spanish-completers with no reported history of mental health treatment both demonstrated lower mean scores. Other patterns that were noted in Factors 4, 5, and 6 indicated that both groups with or without a reported history of mental health history scored just below or close to the mean.

In reviewing the patterns in PMHLS mean scores among English and Spanish-completers with or without a history of mental health treatment, the most salient scoring patterns involved attitudes towards perinatal mood disorders and attitudes towards help-seeking. Given the few associations identified in these exploratory analyses, it is likely that variables other than education level are impacting perinatal mental health literacy. Designed experimental studies using the PMHLS are needed to identify factors that better predict perinatal mental health literacy.

Measurement Considerations – Lessons Learned from Mental Health Literacy

The original definition of the mental health literacy construct described earlier (Jorm et al., 1997) is considered by many to be the "gold standard" definition (Spiker & Hammer, 2018). Many researchers, however, have raised important concerns regarding the lack of an operational definition for this construct. When it was first introduced, Jorm et al. (1997) did not explain the theoretical basis for mental health literacy, nor was the validity or reliability of their vignette tool assessed. Scholars who extended this research proceeded to use this definition without questioning how the individual components of mental health literacy - knowledge, attitudes, and help-seeking - were defined or measured. Furthermore, no consensus on the definition was obtained among scholars. Without a consensus, researchers developed different definitions for the construct. These actions made it much more difficult to define mental health literacy the

same way across studies and has limited the ability to make inferences or comparisons (Spiker & Hammer, 2018). Ultimately, the lack of an operational definition has had a substantial impact on the measurement of mental health literacy.

In the mental health literacy vignette method used by Jorm et al. (1997), the scores obtained for answers (following reading of the vignettes), were reported only at the level of the study population, based on the number of subjects scoring above a pre-defined level. These metrics were then used to compare populations and/or monitor change over time. A critical limitation of this methodology has been the lack of total factor scores for individuals. For this reason, individual mental health literacy could not be estimated and used to study gaps in literacy among individuals and possible change over time (O'Connor, Casey, & Clough, 2014; Furnham & Hamid, 2014; Wei, McGrath, & Kutcher, 2015, 2017; Angermeyer & Schomerus, 2017; Spiker & Hammer, 2018). Perhaps most importantly, the vignette questions were never submitted to measurement standardization procedures. The lack of transparency made it difficult to distinguish what and how each component was being measured. In response to these limitations, researchers have developed scale-based measures such as surveys with multiple-choice, dichotomous, or Likert-response options, all of which allow for the quantification of individuals' levels of mental health literacy, and thus facilitate statistical comparisons (O'Connor, Casey, & Clough, 2014). Once measured, changes to an individual's mental health literacy can be monitored and possible areas for intervention can be identified.

Scale development is a rigorous process whereby the researcher must demonstrate evidence of the reliability and validity of an instrument. To avoid the same methodological challenges that have been found in the measurement of mental health literacy, it is imperative that the construct of perinatal mental health literacy is founded on the development of a clear,

precise and quantifiable definition. Specifically, the six identified factors that have been found to best measure perinatal mental health literacy must be clearly defined. In this step, additional research of each factor may be needed to differentiate it from the others and to facilitate its measurement. The positive results of this standardization study suggest that the specific definitions and items used are an important step towards conceptual and construct consistency. Establishing a shared definition with perinatal mental health literacy researchers, practitioners, and policymakers will also contribute to a consistent measurement of perinatal mental health literacy across future studies (Spike & Hammer, 2018). This process will ensure agreement among researchers about what components should and should not be included and how these components can be measured (Spike & Hammer, 2018). Reliable and valid measurement of perinatal mental health literacy is vital to the development of measurement instruments that can yield results with the potential to improve interventions and thus contribute to positive perinatal mental health outcomes.

In conclusion, the examination of perinatal mental health literacy must prioritize the development and use of psychometrically sound instruments that have been standardized with samples that represent the population being studied. While the research in this field is fairly new, the standardization of the PMHLS allows for the quantification of an individual's level of perinatal mental health literacy, and thus facilitates statistical comparisons (O'Connor, Casey, & Clough, 2014). Once measured, gaps in literacy can be targeted for intervention and most importantly, changes in an individual's perinatal mental health literacy can be tracked over time and further needed areas for intervention can be identified.

The Mental Health Literacy Scale (O'Connor & Casey, 2015) served as a useful model for the development of the PMHLS, as this scale-based measure incorporated the six dimensions

of mental health literacy, demonstrated strong psychometric properties, and thus allowed for comparisons of PMHLS across different demographic groups. In the process of standardization, however, some items referenced in the MHLS were not found to capture any aspect of perinatal mental health literacy in the PMHLS. This finding may partly reflect differences in the participant samples used in the standardization of the MHLS (O'Connor & Casey, 2015) (Australian, English-speaking samples) as compared to the PMHLS (U.S. Hispanic, English and Spanish-speaking samples). This is an important distinction. Attention to the methodological considerations discussed above perhaps contributed to a more accurate measurement of perinatal mental health literacy for U.S. Hispanic women, and perhaps elsewhere, among racially, ethnically, and linguistically diverse groups identified as being most susceptible to experiencing perinatal mood disorders.

Perinatal Mental Health Literacy among Latinas

The PMHLS could serve an important role in transforming the field of perinatal mental health. The lack of a standardized individual-level instrument has limited this field of study. Compared to studies of mental health literacy conducted worldwide, there is a dearth of literature evaluating perinatal mental health literacy. In the U.S., the few studies completed have found significant socioeconomic and racial-ethnic differences in the initiation and continuation of perinatal mental health treatment. These findings indicated that a disproportionate number of lower-income, African American, and Latina women who experienced postpartum depression symptoms did not receive needed services, providing evidence of racial/ethnic perinatal mental health disparities (Ko et al., 2012; Kozhimannil et al., 2011).

For Latinas, cultural beliefs about mental health, language, expectations of motherhood, and fears regarding the negative social connotations associated with mental health treatment have

been shown to present additional barriers to help-seeking. Beliefs related to the expectations of motherhood also influence the identification of mental health symptoms and help-seeking behavior. Latino cultural values such as *familismo* (valuing family above all) and *Marianismo* (valuing highly feminine virtues of purity and moral strength), dictate that a Latina mother must put the needs of her children and family above her own (Lara-Cinisomo, Clark, & Wood, 2018). In this regard, a mother's help-seeking for her own mental health needs would be considered a sign of personal weakness. Fears of the negative social connotations or stigma associated with depression or with receiving mental health treatment have also been shown to be a significant barrier to help-seeking among Latinas.

Being a mother, however, is a highly valued role in the Latino culture, and one that has been rarely examined via research. Future studies examining how perinatal mental health literacy develops among Latinas would benefit from the evaluation of the role of motherhood in mental health. Research and clinical attention to this cultural aspect of identity among Latinas may provide insights into the protective factors that this role may provide to women within their cultural group. The focus on this area of research may also contribute to the development of culturally appropriate physical and verbal responses in which partners and extended family members can demonstrate support to Latina mothers experiencing perinatal mood disorders.

5.2 Limitations and Strengths of Study

The standardization of the PMHLS required the use of a cross-sectional approach that sought to capture the level of perinatal mental health literacy among Latinas in the El Paso border region. Recruitment took place at the University of Texas at El Paso as well as in varied community locations to ensure diverse representation of Hispanic women of childbearing age. Because the primary goal of this study was to standardize a new scale in two languages, a cross-

sectional approach was preferred given that the study was inexpensive to conduct, and recruitment could take place in a short amount of time. Also, a cross-sectional approach is generally considered a good fit for exploratory studies that seek to understand newer areas of research. However, the results of this study may not represent the beliefs of Latinas at a different time point and are not generalizable to the greater El Paso female population. Furthermore, results cannot demonstrate cause and effect relationships between the variables that were examined.

A limitation of this study focused on the type of recruitment conducted and the target population that was used for standardization of the PMHLS. Non-probability convenience sampling methods, common in cross-sectional research, were used for this study to be able to get a large number of participants in a relatively short amount of time. The major potential drawback of convenience sampling concerns the representativeness of the sample. The large number of subjects included in this study may have mitigated that concern to some extent. Also, convenience sampling for this study was used in different contexts. For example, in the university setting, students were individually recruited from open settings around campus, and also by reaching out to faculty and adjunct instructors who allowed classroom recruitment. In community settings, convenience sampling involved seeking permission to recruit from community providers known to the researcher. In this process, the researcher met with providers in person to explain the study, addressed concerns, and acquired permission to attend community events that they led. For example, recruitment over the summer consisted of attending numerous health fairs in different locations across the county that provided access to a high number of female attendees. Recruitment from clinical practices, specifically obstetric and pediatric clinics, was the most difficult to obtain despite many efforts to initiate contact.

The target population for this study was Hispanic females, with those of Mexican descent representing over 90% of the sample in both the exploratory and confirmatory phases of the study. The results of this study, however, may not be generalizable to Latinas of Mexican from other regions in the U.S. Furthermore, the results may not be generalizable to other Latina subgroups or any other racial/ethnic group.

Research studies that involve the standardization of a new or revised scale are necessarily quantitative in nature and this might limit the inclusion of important qualitative details. At the same time, and certainly true in this study, the standardization of health or mental health instruments requires meaningful interaction with the public at large. These interactions thus provide many opportunities to identify additional qualitative information highly relevant to the research questions. In this study, the researcher took notes of each setting where recruitment took place, the type of questions that participants made regarding the PMHLS, the reasons given for refusal to participate, and any comments participants or community providers would make regarding the topic of maternal mental health. These observations and interactions, particularly when patterns or differences are noted, can provide the impetus for future quantitative, qualitative, or mixed-methods research in the areas of maternal mental health, community-academic research partnerships, and Hispanic perinatal mental health disparities.

Lastly, the standardization of the PMHLS focused on asking participants sensitive questions related to mental health during pregnancy or after childbirth. The topic itself, mental health and specifically, mental health during the perinatal period, may have been perceived by female participants as a stigmatizing topic to address. While the questions in the scale did not inquire about their own direct experiences with maternal mental health, participants may have responded as if they had, and this may have affected their responses, particularly if at some point

they had in fact experienced a perinatal mood disorder. To address the sensitivity around the research topic, the researcher provided the same presentation about the study to all participants and emphasized privacy and confidentiality. The researcher was also responsive to questions a participant would ask prior to completion of the survey and emphasized that their participation was voluntary. In community settings, collaboration with community providers was key, and this involved meeting with providers in person to explain the purpose of the study. In the community, the providers often introduced the researcher to the women they provide services to, and this connection with the provider appeared to project a level of trust in the research project.

It is also helpful to consider the strengths of this study. First, very few studies in the U.S. have assessed mental health or perinatal mental health literacy using community samples, and even less have done so with specific focus on Latina populations. This study focused the standardization of the new scale on English and Spanish-language preferring Hispanic participants in both university and community settings. The Spanish used in this study was fully reviewed by a certified Spanish-language translator. In addition, while the El Paso border region has a high density of Hispanic women, the researcher made concerted efforts to obtain diversity in sampling by recruiting in various parts of the city and county to ensure that diverse economic and educational backgrounds were represented. As previously mentioned, much of the research on health, mental health, and perinatal mental health disparities within various Latino subgroups have highlighted poorer outcomes for Latinos with limited English proficiency. Therefore, any research that involves standardization of a new, revised health/mental health scale, or assessment of an intervention, must include representation from Spanish-speaking Latinos. The inclusion of Spanish-speakers in research with Latinos is critical if the goal is to develop evidence-based interventions that incorporate culture and language as contributors to positive health outcomes.

5.3 Implications for Research

The construct of perinatal mental health literacy is relatively new and needs a definitional foundation for all the reasons described above. More research is needed to identify factors that may contribute to the six-factor construct of perinatal mental health literacy quantified in the PMHLS. Contrary to previous findings, exploratory analyses using the standardization samples for this study suggested that income level did not influence perinatal mental health literacy in these Latina samples, and education and history of mental health treatment had minimal influence. Also, more research is needed to determine if these same demographic variables do or do not contribute to the attainment of perinatal mental health literacy among different Latino subgroups, racial/ethnic groups, and other high-risk groups such as adolescent mothers. Specifically, among Latinas, more research into often-referenced cultural and linguistic barriers (Lara-Cinisomo, Clark, & Wood, 2018; Derr, 2015; Lara-Cinisomo et al., 2014; Lara et al., 2009; Abrams, Dornig, & Curran, 2009; Cabassa, Lester, & Zayas, 2007; Munoz et al., 2007; Vega et al., 2007) is needed to identify factors that may enhance or limit help-seeking.

It is also important to consider standardizing this scale with fathers or partners and identified key members of a woman's extended family. Assessing the perinatal mental health literacy of other key support systems may be very important for understanding how to increase knowledge of, improved attitudes towards, and increase help-seeking among new mothers. This has the potential to substantially benefit the health and emotional well-being of the new mother as well as her infant.

In addition to the development of quantitative scales such as the PMHLS, qualitative measures may provide important contributions to understanding an individual's perinatal mental health literacy, through the use of self-report of day-to-day health-related experiences. Similar to

the qualitative health literacy research efforts conducted by Osborne et al. (2013) and Hawkins et al. (2017), questionnaires used in individual interviews or focus groups (with expectant parents and health providers) that incorporate the six factors shown to best define perinatal mental health literacy, might serve to capture the lived experiences of people attempting to understand access to and use of health information and health services in obstetric and pediatric care. For example, the quality of interactions with health providers has been shown to influence decisions to initiate depression treatment among women of color, with past negative interactions and perceptions of health providers becoming significant barriers to help-seeking (Jesse, Dolbier, & Blanchard, 2009; Lara-Cinisomo et al., 2014).

The identification of themes in the experiences of expectant parents in accessing perinatal mental health care from their obstetric provider or their infant's pediatrician, and the bi-directional interactions with these health providers/systems, can offer insights into other factors that might influence the attainment of perinatal mental health literacy that were not captured in the PMHLS. Capturing the exchanges of information between the patient and provider and noting who initiates discussions related to perinatal mental health and how those concerns are addressed, can provide meaningful data regarding the factors that facilitate or impede help-seeking. In addition, cultural beliefs about mental health, stigma, and how this influences knowledge about perinatal mental health disorders and help-seeking can be identified via qualitative methods that inquire about how these ideas were developed, and how they are sustained by familial and cultural influences. The use of this type of "grounded" methodology, in which input from pregnant/postpartum women, partners, and health experts, and observations of their interactions, can serve as the basis for modifying the PMHLS and/or developing a new but related scale.

Implications for Practice

Despite the volume of research examining the prevalence of and treatment for perinatal psychiatric disorders, there is a dearth of knowledge focused on educational approaches that aim to reduce and eliminate perinatal mental health disparities. One educational approach that was developed to reduce the risk of perinatal depression among Latina mothers is a curriculum called Mothers and Babies/Mamas y Bebes (Tandon et al., 2018; Munoz et al., 2007) that incorporates interpersonal and cognitive-behavioral therapeutic techniques. Review of this curriculum and others that focus on addressing perinatal mental health will be an important step in determining which interventions are applicable to the targeted research population. In working with Latinas, it will be important to evaluate the cultural and linguistic considerations that are included in any intervention and confirm that significant reductions in symptom presentation are reported. Along with a literature review of the current research on the evidence-based interventions that have been created to target perinatal mood disorders, another task will be to assess the needs of the local community and the programs that provide additional supports to pregnant postpartum women. Identification of these resources can be leveraged as a way to provide the intervention and may be more culturally acceptable to women and their families.

A final consideration is how perinatal mental health screening might be integrated into the current healthcare system. The condition of pregnancy compels women to try to make decisions that positively and simultaneously impact their own health and the health of their infant. During this life transition, women in the U.S. will most often interact with two separate systems of health care – obstetrics and pediatrics. During pregnancy, women are offered monthly and more frequent check-ups to assess the progress of their pregnancy and monitor the health of their fetus.

Current recommendations from the American College of Obstetricians and Gynecologists (ACOG) suggest that obstetrician–gynecologists and other obstetric care providers screen patients at least once during the perinatal period for depression and anxiety symptoms using a standardized, validated tool (ACOG, 2018). Similarly, the American Academy of Pediatrics (AAP) recommends integrating postpartum depression surveillance and screening at the 1-, 2-, 4-, and 6-month well-child visits (Earls, 2010). The time and effort in screening women for perinatal mood disorders varies substantially across the nation, however, with less than half of pediatric and obstetric providers asking about or screening for depression (Evans, Phillippi & Gee, 2015). As was previously noted, this finding glaringly reveals a multitude of missed opportunities for identifying women who are experiencing perinatal mood disorder symptoms. Continued efforts are needed, especially at the local level, to identify facilitators and barriers for physicians in screening women for mood disorders. The identification of interventions that promote screening and the exchange of educational materials related to maternal mental health for new and expectant parents would therefore serve to improve health and mental health outcomes for both mother and infant.

In conclusion, increased communication efforts between pediatricians and obstetricians and the integration of care is therefore greatly needed to identify maternal mental health issues early, anticipate negative impacts to a mother's and infant's health, and connect the family to available community mental health resources. The exchange of this information, via signed consent forms allowing this information to be shared, can be facilitated by the presence within the clinic setting of a bachelor's level health care specialist, social worker, or community health worker who can help to coordinate care for families, and report outcomes of referral sources back to the medical providers. In addition, having this type of specialist may also allow

physicians to monitor similar health areas such as infant development in pediatric settings and general reproductive health care in obstetric clinics.

Recommendations for Interdisciplinary Collaborations

Addressing perinatal mental health should be a critical part of obstetric and pediatric care, as well as the responsibility of community health and other systems of care that offer some type of support to pregnant/postpartum women. Community programs such as WIC, home-visiting programs, breastfeeding groups, and insurance programs that enroll pregnant women and newborns, can also provide some level of education to new moms regarding perinatal mental health. When these programs work together collaboratively, providers with limited time can connect new mothers to other community resources that can fill gaps with regard to education, support, and follow up resources.

Given the potential negative outcomes for unaddressed mental illness, perinatal mental health care should be embedded in routine clinical care offered in obstetric and pediatric practices. One approach to meeting this goal is to incorporate screening for perinatal mood disorders into routine prenatal and pediatric care. This can be done by aligning perinatal mental health screening/monitoring with other measures of health care such as the assessment of risk for gestational diabetes and hypertension during pregnancy, or the review of infant health and development during pediatric well-child visits. Patients would be given general information regarding the relationship between health conditions such as diabetes or high blood pressure, and mental health, and this may help normalize the need for additional screening for mood disorders. For example, women can be given the Edinburgh Postnatal Depression Screen (EPDS), a brief standardized perinatal depression scale, to complete prior to meeting with a physician for a prenatal or well-child visit. Providing physicians with trainings on perinatal mood disorders,

algorithms for screening, and the identification of community referral resources could greatly enhance the health care offered to mothers and infants.

Conclusion

The purpose of this study was to test the psychometric properties of a new survey instrument called the Perinatal Mental Health Literacy Scale (PMHLS). The study was innovative in several ways. First, the PMHLS was developed to measure perinatal mental health literacy, and specifically, the components of knowledge and attitudes shown to promote recognition and appropriate help-seeking for psychiatric disorders in the perinatal period. To date, there are no standardized measures of perinatal mental health literacy in the literature, a critical knowledge gap in the measurement of this construct. Second, currently there is a dearth of knowledge pertaining to the measurement of mental health literacy among Hispanic/Latino populations in general, and in particular, the study of perinatal mental health literacy in Latinas. The research showing the association of these factors with disparities in the treatment of perinatal mental health disorders suggested that addressing perinatal mental health literacy among high-risk mothers is one critical pathway for reducing disparities in the treatment of perinatal mental health. Basing the standardization on participants of Hispanic/Latino descent was another contribution to the literature, given that there are limited standardized measures of mental health that have been validated with Latinos. The standardization of this instrument with English and Spanish-language speaking Latinas will contribute to the development of evidence-based interventions that strive to decrease perinatal mental health disparities among this group.

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APPENDIX A: STUDY INFORMATION SHEET (ENGLISH)

Protocol Title: Pregnancy and Postpartum Health Survey

Principal Investigator: Irma Torres-Catanach, MS

UTEP: Interdisciplinary Health Sciences Department

Dear Participant,

You are being asked to take part voluntarily in a research study that seeks to obtain information regarding your knowledge of health issues that may affect women during pregnancy or in the first year after childbirth. You are being asked to participate because you are a woman between the ages of 18-45. If you decide to participate in this study, you will be asked to complete a Pregnancy and Postpartum Health Survey. The survey will be completed anonymously and will take you approximately 10-20 minutes to complete.

Taking part in this study is **voluntary**. You have the right to refuse participation. Your participation, or lack thereof, will have no effect on the services you are receiving or your course grade. If you do complete the survey, you have the option of entering your name into a raffle where ten $100 Walmart gift cards will be given away. Participants who voluntarily choose to enter the raffle will be asked to provide their name and phone # so that the raffle gift card can be mailed to them if their name is randomly drawn. The researcher will provide participants with an index card in which to document this information. Raffle entries will be kept in a sealed envelope and entries will not be connected to individual survey responses. Identifiable information such as your name, address, or phone number will not be collected nor connected to your survey responses.

Please ask any questions you may have now. If you have questions later, or if you have a research-related problem you may call Irma Torres-Catanach or Christina Sobin, PhD, at (915) 747- 8309 or via email at iytorrescatanach@utep.edu and casobin@utep.edu. You can also contact the UTEP Institutional Review Board (IRB) at (915-747-7693) or irb.orsp@utep.edu.

I have read this paper about the study (or it was read to me). I know that being in this study is

voluntary and I choose to be in this study. I will get a copy of this consent form now for me to keep. I agree to participate in this research project. My participation will be reflected in the completion of the Postpartum and Pregnancy Health Survey.

APPENDIX A: STUDY INFORMATION SHEET (SPANISH)

Título del Protocolo: Encuesta Sobre La Salud Durante y Después del Embarazo

Investigadores principales: Irma Torres-Catanach, MS

Departamento de UTEP: Ciencias de la Salud Interdisciplinares

Estimada Participante,

Se te pide que participes voluntariamente en un estudio de investigación que busca obtener información sobre tu conocimiento de los problemas de salud que pueden afectar a las mujeres durante el embarazo o en el primer año después del parto. Se te pide que participes porque tú eres una mujer entre las edades de 18-45. Pedimos que completes una encuesta sobre la salud durante el embarazo y después del parto. La encuesta se completará de forma anónima y te llevará aproximadamente 10-20 minutos para completar.

Tu participación en este estudio es **voluntaria**. Tú tienes el derecho de rechazar la participación. Tu participación, o falta de ella, no tendrá ningún efecto en los servicios que recibes del programa WIC. Si completas esta encuesta, tienes la opción de poner tu nombre en una rifa en donde se regalarán diez tarjetas de Wal-Mart con valor de $100. Participantes que voluntariamente opten por participar en el sorteo se les pedirá que proporcionen su nombre y teléfono para que se les pueda enviar la tarjeta de regalo de la rifa si su nombre se selecciona al azar. Proporcionaré a los participantes una tarjeta de índice para documentar esta información. La colección de entradas para la rifa se guardará en un sobre cerrado y las entradas no se conectarán a las respuestas de las encuestas individuales. Información identificable, como tú nombre, dirección o número de teléfono no se va a colectar ni conectar con tus respuestas a la encuesta.

Puedes hacer cualquier pregunta que tienes ahora. Si después tienes preguntas, o si tienes un problema relacionado con la investigación, puedes llamar a Irma Torres-Catanach o Christina Sobin, PhD, al (915) 747- 8309 o por correo electrónico a iytorrescatanach@utep.edu y casobin@utep.edu. También puede comunicarse con la Junta de Revisión Institucional (IRB) de

UTEP al (915-747-7693) o irb.orsp@utep.edu.

He leído este documento sobre el estudio (o me lo leyeron). Sé que estar en este estudio es voluntario y elijo estar en este estudio. Recibiré una copia de este formulario de consentimiento ahora para que la conserve. Estoy de acuerdo en participar en este estudio de investigación. Mi participación se reflejará en completando la Encuesta de Salud Durante y Después del Embarazo.

APPENDIX B – PMHLS (ENGLISH)

Pregnancy and Postpartum Health Survey

The purpose of this survey is to gain an understanding of your knowledge of health issues that may affect women during pregnancy or in the first year after childbirth. Please answer **all** the questions. There are no right or wrong answers. This is an anonymous survey and will remain confidential.

The questions below ask about "mental health disorders", which refer to **serious problems in thinking, feeling, and/or behaving.**

Please put a check (☐) under the answer that best describes how much you agree or disagree with each statement (strongly disagree, disagree, not sure, agree, strongly agree):

1. A mental health disorder during pregnancy or after childbirth is a sign of personal weakness.

2. A mental health disorder during pregnancy or after childbirth is not a real medical illness.

3. Seeing a mental health professional during pregnancy or after childbirth shows that a woman is not strong enough to manage her own problems.

4. Women with mental health disorders during pregnancy or after childbirth could "snap out of it" if they wanted.

5. Women with mental health disorders during pregnancy or after childbirth are a danger to themselves and to their baby.

6. If I had a mental health disorder, I would tell someone.

7. If I had a mental health disorder, I would seek professional help.

8. I believe that treatment for a mental health disorder would be effective.

9. If someone I know and love had a mental health disorder, he or she would tell others.

10. If someone I know and love had a mental health disorder, he or she would seek professional help.

11. People I know and love believe that treatment for a mental health disorder would be effective.

12. If a person threatens to hurt himself/herself or someone else, it is okay for a mental health professional to call 911 and get help from others right away.

13. If a person has a mental health disorder that is not life threatening, it is okay for a mental health professional to tell family or friends, so they can offer help and support.

How often do you do the following? Put a check (☐) under your answer (never, rarely, sometimes, frequently, or always):

14. I search for information about mental health disorders online, using a computer or cell phone.

15. I search for information about mental health disorders from mental health professionals, doctors, and/or community providers.

16. I know where to get information about mental health disorders in the community where I live.

17. I attend appointments with a mental health professional to get information about mental health disorders.

18. I search for information about mental health disorders from my partner, family, and/or friends.

Put a check (☐) under the answer that best describes how likely you think that these statements are correct (very unlikely, unlikely, not sure, likely, very likely).

19. Women who have had anxiety or depression in the past (before they became pregnant) are more likely to experience anxiety or depression when they are pregnant or after childbirth.

20. Women who experience stressful life events during pregnancy or after childbirth are more likely to experience anxiety or depression during those times.

21. Women who report little or no support from their partner, family, or friends during pregnancy or after childbirth are more likely to experience anxiety or depression during those times.

Put a check (☐) under the answer that best describes how likely you think that these statements are correct (very unlikely, unlikely, not sure, likely, very likely):

Imagine a woman who is pregnant or just had a baby:

22. If the woman feels very nervous, worries about many things, including her baby, and finds it difficult to control the worry, she has a medical condition called **"**Anxiety Disorder".

23. If the woman feels sad/depressed some days but is very 'hyperactive' on other days and does not sleep, she has a medical condition called "Bipolar Disorder".

24. If the woman experiences or witnesses a traumatic event, has upsetting memories of the event, and avoids anything that reminds her of that event, she has a medical condition called "Trauma & Stressor-Related Disorder".

25. If the woman has lost interest in her normal activities and feels sad nearly every day for

more than two weeks, she has a medical condition called “Major Depressive Disorder”.

26. If the woman has persistent, fearful thoughts and tries to control them by doing repetitive behaviors such as excessively cleaning or checking on the baby, she has a medical condition called “Obsessive-Compulsive Disorder”.

27. If the woman, within the first few days or weeks after childbirth, cannot sleep at all, has severe mood changes, and has thoughts about hurting herself or her baby, she has a medical condition called **“**Brief Psychotic Disorder”.

28. If the woman, within a few days after childbirth, feels irritable or cries frequently but says these feelings go away, she is experiencing a common condition called “postpartum baby blues”.

29. Interpersonal Therapy helps people improve their relationships with others. This therapy would be helpful for women who experience anxiety or depression during pregnancy or after childbirth.

30. Cognitive Behavioral Therapy helps people change their negative thoughts and behaviors. This therapy would be helpful for women who experience anxiety or depression during pregnancy or after childbirth.

A woman is pregnant or just had a baby and is feeling very anxious or depressed. How helpful is it for this woman to do the following? (select – very unhelpful, unhelpful, not sure, helpful, very helpful):

31. Include safe forms of exercise in her daily routine.

32. Talk with her partner, family, or friends about her feelings.

33. Avoid situations that make her feel anxious or depressed.

34. Spend some time outside the home, with her partner, or with her friends.

APPENDIX C – PMHLS (SPANISH)

El propósito de esta encuesta es tener una idea de lo que usted sabe sobre los factores que pueden afectar la salud de la mujer durante el embarazo o en el primer año después del parto. Favor de contestar **todas** las preguntas. No existen respuestas correctas o incorrectas y esta encuesta es confidencial.

Las preguntas siguientes se tratan de los "trastornos de salud mental", que son **problemas serios al pensar, sentir y/o comportarse**.

Favor de marcar con una palomita (□) la respuesta que mejor describa que tanto está usted de acuerdo o en desacuerdo con cada enunciado (totalmente en desacuerdo, en desacuerdo, ni de acuerdo ni desacuerdo, de acuerdo, totalmente de acuerdo):

1. Un trastorno de salud mental durante o después del embarazo es una señal de debilidad personal.

2. Un trastorno de salud mental durante o después del embarazo no es una verdadera enfermedad médica.

3. Ver a un profesional de salud mental durante o después del embarazo significa que una mujer no es lo suficientemente fuerte para manejar sus propios problemas.

4. Las mujeres con trastornos mentales durante o después del embarazo podrían “echarle ganas” y "salir de eso" si quisieran.

5. Las mujeres con trastornos mentales durante o después del embarazo son un peligro para ellas mismas y para su bebé.

6. Si yo tuviera un trastorno de salud mental, yo se lo diría a alguien.

7. Si yo tuviera un trastorno de salud mental, yo buscaría ayuda profesional.

8. Creo que el tratamiento para un trastorno de salud mental sería efectivo.

9. Si alguien que conozco y amo tuviera un trastorno mental, él o ella le dirían a alguien.

10. Si alguien que conozco y amo tuviera un trastorno de salud mental, él o ella buscarían la ayuda de un profesional.

11. Las personas que conozco y amo creen que el tratamiento para un trastorno de salud mental sería efectivo.

12. Si una persona amenaza con lastimarse a sí misma o a otra persona, está bien que un profesional llame al 911 y obtenga ayuda de otras personas inmediatamente.

13. Si una persona tiene un trastorno mental que no pone en peligro su vida, está bien que un profesional le cuente a familiares o amigos para que ellos también puedan ofrecer ayuda y apoyo.

¿Qué tan seguido hace usted lo siguiente? Marque una palomita (□) debajo de su respuesta (nunca, raramente, algunas veces, frecuentemente, siempre):

14. Busco información sobre trastornos mentales de fuentes en línea, utilizando una computadora o el teléfono celular.

15. Busco información sobre los trastornos de salud mental que ofrecen profesionales, médicos y / o proveedores de la comunidad.

16. Sé dónde conseguir información sobre los trastornos de salud mental en la comunidad donde vivo.

17. Asisto a consultas con profesionales de salud mental para obtener información sobre los trastornos de salud mental.

18. Busco información sobre los trastornos de la salud mental de mi pareja, familia y / o amigos.

Marque (□) la respuesta que mejor describa qué tan probable es que estos enunciados sean correctos (muy improbable, improbable, no estoy segura, probable, muy probable):

19. Las mujeres que han tenido ansiedad o depresión (antes de quedar embarazadas) son más propensas a sufrir de ansiedad o depresión durante o después del embarazo.

20. Las mujeres que pasan por eventos estresantes durante o después del embarazo son más propensas a sufrir de ansiedad o depresión en esos tiempos.

21. Las mujeres que tienen poco o nada de apoyo de su pareja, familia, o amigos durante o después del embarazo son más propensas a sufrir de ansiedad o depresión en esos tiempos.

Marque (□) la respuesta que mejor describa qué tan probable es que estos enunciados sean correctos (muy improbable, improbable, no estoy segura, probable, muy probable):

Imagínate a una mujer embarazada o que acaba de tener un bebé:

22. Si la mujer se siente muy nerviosa, preocupada por muchas cosas y por su bebé, y le resulta difícil controlar esa preocupación, ella tiene una condición médica llamada "trastorno de ansiedad".

23. Si la mujer se siente triste/deprimida algunos días, pero está muy 'hiperactiva' otros días y no duerme, ella tiene una condición médica llamada "trastorno bipolar".

24. Si la mujer ha pasado por un evento traumático, tiene malos recuerdos del evento, y evita cualquier cosa que le recuerde ese evento, ella tiene una condición médica llamada "trastorno relacionado con trauma y estrés".

25. Si la mujer ha perdido interés en hacer cosas y se siente triste casi todos los días por más de dos semanas, ella tiene una condición médica llamada "trastorno depresivo mayor".

26. Si la mujer tiene pensamientos temerosos y persistentes, y trata de controlarlos haciendo comportamientos repetitivos, como limpiar excesivamente o vigilando al bebé, ella tiene una condición médica llamada “trastorno obsesivo-compulsivo”.

27. Si la mujer, dentro de los primeros días o semanas después del parto no puede dormir en absoluto, tiene cambios severos de humor y tiene pensamientos de hacerse daño a sí misma o a su bebé, ella tiene una condición médica llamada “trastorno psicótico breve”.

28. Si la mujer, dentro de unos días después del parto, se siente irritable o llora mucho, pero dice que estos sentimientos desaparecen, ella está pasando por una condición común llamada “tristeza posparto”.

29. La terapia interpersonal se usa para mejorar las relaciones con los demás. Esta terapia sería útil para las mujeres que tienen ansiedad o depresión durante o después del embarazo.

30. La terapia conductual cognitiva se usa para ayudar a las personas a cambiar sus pensamientos y conductas negativas. Esta terapia sería útil para las mujeres que tienen ansiedad o depresión durante o después del embarazo.

Una mujer está embarazada o acaba de tener un bebé y se siente muy ansiosa o deprimida. ¿Qué tan útil seria para ella hacer lo siguiente? (muy inútil, inútil, no estoy segura, útil, muy útil)

31. Incluir en su rutina diaria algunas formas seguras de ejercicio.

32. Hablar con su pareja, familia o amigos acerca de sus sentimientos.

33. Evitar situaciones que la hagan sentirse ansiosa o deprimida.

34. Pasar algún tiempo fuera de su casa, con su pareja, o con amigos.

APPENDIX D – DEMOGRAPHIC QUESTIONS

1. Age: ☐ 18-24 ☐ 25-31 ☐ 32-38 ☐ 39-45

2. Gender: ☐ Female ☐ Male ☐ Other

3. Race/Ethnicity: ☐ White ☐ African American ☐ Hispanic/Latino ☐ Asian American ☐ Other

If Hispanic/Latino(a), choose one:

☐ Mexican ☐ Puerto Rican ☐ Cuban ☐ Guatemalan ☐ Salvadoran

☐ Honduran ☐ Another Hispanic/Latino group

4: Were you born in the United States? ☐ Yes ☐ No

5. Personal Income: ☐ less than $15,000 (287,376 pesos) ☐ $15,000-$29,999 (287,376 - 574,705 pesos) ☐ $30,000-$49,999 (574,689 – 957,795 pesos) ☐ $50,000 or more (957,864 pesos)

6. Education: ☐ less than High School ☐ High School/GED ☐ Taken some college courses☐ Associate Degree ☐ Bachelor's Degree ☐ Master's Degree or higher

7. Employment: ☐ Unemployed, looking for work ☐ Not looking for work ☐ Part-time ☐ Full-time

8. Are you currently pregnant? ☐ Yes ☐ No

9. Do you have children? ☐ Yes ☐ No If **yes**, how many? ☐ 1 ☐ 2 ☐ 3 or more

10. Have you or a family member ever received mental health services such as counseling or medications? ☐ Yes ☐ No

APPENDIX D – DEMOGRAPHIC QUESTIONS (SPANISH)

1. Edad:

☐ 18-24 ☐ 25-31 ☐ 32-38 ☐ 39-45

2. Género:

☐ Masculino ☐ Femenino ☐ Otro

3. Raza/Etnia:

☐ Blanco ☐ Afroamericano ☐ Hispana/Latina ☐ Asiático Americano ☐ Otro

Si usted es Hispana/Latina, seleccione una respuesta:

☐ Mexicana ☐ Puertorriqueña ☐ Cubana ☐ Guatemalteca

☐ Salvadoreña ☐ Hondureña ☐ otro grupo Hispano/Latino

4. ¿Nació en los Estados Unidos? ☐ Sí ☐ No

5. Ingresos Personales:

☐ Menos de $15,000 (287,376 pesos) ☐ $15,000-$29,999 (287,376 - 574,705 pesos)
☐ $30,000-$49,999 (574,689 – 957,795 pesos) ☐ Más de $50,000 (957,864 pesos)

6. Educación:

☐ Grado menor de preparatoria ☐ Preparatoria/GED ☐ algunas clases en la universidad
☐ título de asociado (AA, AS) ☐ Licenciatura (BA, BS) ☐ Maestría o superior

7. Empleo:

☐ Desempleada, buscando trabajo ☐ No estoy buscando trabajo ☐ Trabajo de medio tiempo ☐ Trabajo de tiempo completo

8. ¿Está usted embarazada? ☐ Sí ☐ No

9. ¿Tiene hijos? ☐ Sí ☐ No

¿**Si tiene hijos**, cuántos hijos tiene? ☐ 1 ☐ 2 ☐ 3 o más

10. ¿Ha recibido usted, o algún miembro de su familia, servicios de salud mental tales como asesoramiento o medicamentos? ☐ Sí ☐ No

APPENDIX E – BASH SCALE (ENGLISH AND SPANISH)

	Only Spanish	**More Spanish than English**	**Both Equally**	**More English than Spanish**	**Only English**
In general, what language do you read and speak?					
What language do you usually speak at home?					
In what language do you usually think?					
What language do you usually speak with your friends?					

	Sólo Español	**Español más que Inglés**	**Ambos**	**Inglés más que Español**	**Sólo Inglés**
En general, ¿en qué idioma lees y hablas?					
¿Qué idioma hablas usualmente en tu casa?					
¿En qué idioma piensas usualmente?					
¿En qué idioma hablas usualmente con tus amigos?					

APPENDIX F – GENERAL HELP-SEEKING QUESTIONNAIRE (ENGLISH)

Please indicate your response by circling the number that best describes your intention to seek help from each help source that is listed.

1 = Very Unlikely 2 = Unlikely 3 = Somewhat Likely 4 = Likely

5 = Very Likely

If you were having a personal or emotional problem, how likely is it that you would seek help from the following people?

a. Husband/wife, boyfriend/girlfriend, or an intimate partner	1	2	3	4	5
b. Friend (not related to you)	1	2	3	4	5
c. Parent (biological, stepparent, adoptive)	1	2	3	4	5
d. Other family member (sibling, cousin, aunt, uncle, grandparent)	1	2	3	4	5
e. Mental health professional (counselor, social worker, psychologist)	1	2	3	4	5
f. Crisis helpline, phone app, or website	1	2	3	4	5
g. Doctor (primary care, ob-gyn, specialist)	1	2	3	4	5
h. Minister or religious leader (priest, rabbi, chaplain, etc.)	1	2	3	4	5
i. I would not seek help from anyone	1	2	3	4	5
j. I would seek help from a person not listed above (work colleague, neighbor, folk healer, etc.). Please list here:	1	2	3	4	5

If you were experiencing suicidal thoughts, how likely is it that you would seek help from the following people?

a. Husband/wife, boyfriend/girlfriend, or an intimate partner	1	2	3	4	5
b. Friend (not related to you)	1	2	3	4	5
c. Parent (biological, stepparent, adoptive)	1	2	3	4	5
d. Other family member (sibling, cousin, aunt, uncle, grandparent)	1	2	3	4	5

e. Mental health professional (counselor, social worker, psychologist)	1	2	3	4	5
f. Crisis helpline, phone app, or website	1	2	3	4	5
g. Doctor (primary care, ob-gyn, specialist)	1	2	3	4	5
h. Minister or religious leader (priest, rabbi, chaplain, etc.)	1	2	3	4	5
i. I would not seek help from anyone	1	2	3	4	5
j. I would seek help from a person not listed above (work colleague, neighbor, folk healer, etc.). Please list here:	1	2	3	4	5

APPENDIX F – GENERAL HELP-SEEKING QUESTIONNAIRE (SPANISH)

. Indique su respuesta marcando con un círculo el número que mejor describe su intención de buscar ayuda de cada fuente de ayuda que se encuentra en la lista.

1 = Muy Improbable **2 = Improbable** **3 = Algo Probable** **4 = Probable**

5 = Muy Probable

Si tuviera un problema personal o emocional, ¿qué tan probable es que buscaría ayuda de las siguientes personas?

a. Esposo/esposa, novio/novia, o un compañero íntimo	1	2	3	4	5
b. Amigo/a (no relacionado con usted)	1	2	3	4	5
c. Padre/Madre (biológico/a, padrastro/madrastra, adoptivo/a)	1	2	3	4	5
d. Otro miembro de la familia (hermano/a, primo/a, tío/a, abuelo/a)	1	2	3	4	5
e. Profesional de salud mental (consejero/a, trabajador/a social, psicólogo/a)	1	2	3	4	5
f. Teléfono de ayuda, aplicación de teléfono, o sitio web	1	2	3	4	5
g. Médico (atención primaria, ginecólogo/a, especialista)	1	2	3	4	5
h. Ministro o líder religioso (sacerdote, rabino, capellán, etc.)	1	2	3	4	5
i. No buscaría ayuda de nadie	1	2	3	4	5
j. Buscaría ayuda de uno/a que no está en la lista (compañero/a de trabajo, vecino/a, curandero/a, etc.). Por favor anote aquí:	1	2	3	4	5

Si estuviera experimentando pensamientos de lastimarse o quitarse la vida, ¿qué tan probable es que buscaría ayuda de las siguientes personas?

a. Esposo/esposa, novio/novia, o un compañero íntimo	1	2	3	4	5
b. Amigo/a (no relacionado con usted)	1	2	3	4	5
c. Padre/Madre (biológico/a, padrastro/madrastra, adoptivo/a)	1	2	3	4	5

d. Otro miembro de la familia (hermano/a; primo/a, tío/a, abuelo/a)	1	2	3	4	5
e. Profesional de salud mental (consejero/a, trabajador/a social, psicólogo/a)	1	2	3	4	5
f. Teléfono de ayuda, aplicación de teléfono, o sitio web	1	2	3	4	5
g. Médico (atención primaria, ginecólogo/a, especialista)	1	2	3	4	5
h. Ministro o líder religioso (sacerdote, rabino, capellán, etc.)	1	2	3	4	5
i. No buscaría ayuda de nadie	1	2	3	4	5
j. Buscaría ayuda de uno/a que no está en la lista (compañero/a de trabajo, vecino/a, curandero/a, etc.). Por favor anote aquí:	1	2	3	4	5

APPENDIX G – KESSLER PSYCHOLOGICAL DISTRESS SCALE (ENGLISH)

The following questions ask about how you have been feeling **in the past 30 days**. For each question, please select the option that best describes how often you had this feeling. In the past 30 days, how often did you feel:

	All of the time	Most of the time	Some of the time	A little of the time	None of the time
tired out for no good reason?	❑	❑	❑	❑	❑
nervous?	❑	❑	❑	❑	❑
so nervous that nothing could calm you down?	❑	❑	❑	❑	❑
hopeless?	❑	❑	❑	❑	❑
restless or fidgety?	❑	❑	❑	❑	❑
so restless that you could not sit still?	❑	❑	❑	❑	❑
depressed?	❑	❑	❑	❑	❑
so depressed that nothing could cheer you up?	❑	❑	❑	❑	❑
that everything was an effort?	❑	❑	❑	❑	❑
that you are worthless?	❑	❑	❑	❑	❑

APPENDIX G – KESSLER PSYCHOLOGICAL DISTRESS SCALE (SPANISH)

Las siguientes preguntas son acerca de cómo se ha sentido usted **en los últimos 30 días.** Para cada pregunta, por favor escoja la opción (□) que mejor describa qué tan seguido ha tenido este sentimiento. En los últimos 30 días, qué tan frecuente se ha sentido…

	Todo el tiempo	La mayoría del tiempo	A veces	Pocas veces	Nunca
¿cansada sin algún motivo?	❑	❑	❑	❑	❑
¿nerviosa?	❑	❑	❑	❑	❑
¿tan nerviosa que nada podía calmarla?	❑	❑	❑	❑	❑
¿sin esperanza?	❑	❑	❑	❑	❑
¿inquieta o intranquila?	❑	❑	❑	❑	❑
¿tan inquieta que no podía permanecer sentada?	❑	❑	❑	❑	❑
¿deprimida?	❑	❑	❑	❑	❑
¿tan deprimida que nada podía animarla?	❑	❑	❑	❑	❑
¿que todo era un esfuerzo?	❑	❑	❑	❑	❑
¿que usted no vale la pena?	❑	❑	❑	❑	❑

CURRICULUM VITA

Irma Torres-Catanach, a native El Pasoan, is a licensed mental health clinician who obtained her Bachelor of Arts degree in Psychology from New Mexico State University in 1997 and her Master of Science degree in Counseling Psychology from Our Lady of the Lake University in 1999. Irma previously considered obtaining her doctorate right after graduate school, but instead chose to start her career as a practicing clinician. The idea for pursuing a doctoral degree reemerged in 2012 after a long conversation with a colleague, a fellow mom with young children, who shared her own plans to do so. After further discussions with friends and loved ones, Irma applied to the Interdisciplinary Health Sciences PhD program at UTEP and was accepted into the 2015 cohort. Five years later, Irma successfully defended her dissertation.

Prior to starting the doctoral program, Irma worked extensively as a mental health clinician in various community settings in Santa Fe, NM, where she lived for fifteen years. It was through her work providing mental health services to pregnant/postpartum women, their children, and families that her passion for maternal and infant mental health was fortified. Her clinical interests continue to focus on the prevention and treatment of perinatal mood disorders, and the implementation of evidence-based interventions used to reduce symptoms and improve the emotional well-being of new mothers.

During her time at UTEP, Irma worked as a research assistant and lecturer teaching online and face to face courses. She also worked briefly at a mental health outpatient clinic in Las Cruces, NM. For the last two years she has worked in the College of Engineering, under the direction of Dr. Velez-Reyes and Dr. Santiago, on an NSF-funded grant supporting the transition of Latino/a doctoral STEM students into academic positions at community colleges.