



THE LOUIS DE LA PARTE FLORIDA MENTAL HEALTH INSTITUTE



Development and Testing of an Instrument to Measure Mental Health Literacy

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Development and Testing of an Instrument to Measure Mental Health Literacy

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Development and Testing of an Instrument to Measure Mental Health Literacy

Executive Summary

The conceptual model of mental health literacy is defined as the ability to use messages to create meanings in such a way as they result in behaviors helpful to a mental healthcare consumer's mental health and well being. The ability to measure caregiver's or provider's mental health literacy has the potential benefits of improving health care, lowering costs, increasing empowerment, and improving communication. Measurement can focus the identification of strengths and weaknesses and focus the development of training, awareness and communication tools. Currently, there is no measure of mental health literacy for caregivers of children with severe emotional disturbances (SED).

The need for a tool to measure mental health literacy prompted the development of a caregiver and provider instrument. This study focuses on answering research questions in relation to these newly developed instruments. The three research questions were:

- Can caregivers' and providers' mental health literacy and knowledge be measured in a way that is valid and reliable?
- How does a constructed measure of mental health literacy, based on an initial caregiver survey instrument developed in this study, perform in a statistical model of mental health care utilization?
- What is the role of language and culture in health literacy among non-native, Spanish-speaking caregivers and their providers?

Methods

The caregiver and provider instruments were developed based on focus groups and a literature review completed in last year's study by the Florida Mental Health Institute. The instruments were administered in two waves to caregivers and providers in Hillsborough County, Florida following USF Institutional Review Board (IRB) guidelines. Results were analyzed with rigorous statistical analyses that resulted in a shortened caregiver instrument and many findings concerning the relationship between mental health literacy and demographics and service utilization.

In addition, a focus group protocol was developed for non-native, Spanish-speaking caregivers that was utilized in a focus group this year. The focus group administration also followed IRB guidelines for the protection of human participants and led to the development of additional questions to be added to the caregiver instrument.

Major Findings

This study refined the early development of the mental health literacy measure through development and administration of the instruments and focus groups. Major findings were developed from a statistical and empirical model analysis based on the results of the administration of the instruments. Major accomplishments and findings included:

- Preliminary development of two instruments (caregiver and provider) to measure mental health literacy,
- Reduction of the Caregiver mental health literacy instrument,
- Caregivers with a higher mental health literacy have a lower number of service visits per year,
- Caregivers' overall mental health literacy score has a negative relationship with education,
- Caregivers with a college education have more factual knowledge about mental health, but not necessarily higher mental health literacy,
- In the shortened Caregiver mental health literacy model, the caregivers' overall mental health literacy score has a positive relationship with the number of years of experience with the mental health system,
- Younger caregivers have a higher mental health literacy score, and
- Caregivers in poor or fair general health have lower mental health literacy scores.

Discussion

Through the development and analysis of results of the caregiver mental health literacy instrument, the instrument was reduced to 28 questions using a 5-point Likert scale. The reduction is a necessary step in the preliminary development of the instrument and will allow for ease of administration, reduced burden for participants and stronger results.

Using the revised (28-item) overall measure of mental health literacy in the service utilization analysis, a logistic model was used to estimate the probability that an eligible PMHP Medicaid recipient uses any non-acute behavioral health services during a 12-month period. The results showed the average number of visits fell from 9 visits per year for respondents with low literacy to 5 visits per year for respondents with high literacy. This compares to a baseline average of 8 visits per year for the entire sample.

There is a decrease in mental health literacy as educational attainment increases. Results indicate that both high school and college-educated individuals are less literate than those with less than a high school education. While this result may seem counterintuitive, it is consistent with the test of construct validity, which found a statistically significant negative relationship between mental health literacy and education.

In addition, factual knowledge about mental health had little to do with the overall mental health literacy score. College educated caregivers were more likely to have higher factual knowledge about mental health, but not necessarily higher mental health literacy scores. This showed that factual knowledge is not the same as mental health literacy.

In the original version of the caregiver mental health literacy model, the overall mental health literacy score had no relation to the number of years of experience a caregiver had in the mental health system. However, in the shortened caregiver mental health literacy model, the caregivers' overall mental health literacy score has a positive relationship with the number of years of experience with the mental health system. Therefore, a caregiver that had more experience with the mental health system had a higher overall mental health literacy score.

In analyzing the demographic characteristics of caregivers in relation to the overall mental health literacy score, it was found that caregivers who were younger (less than 40 years of age) or in better general health had higher mental health literacy scores.

Recommendations

The development and analysis of the results of the mental health literacy instruments showed positive impact toward the understanding of how mental health literacy relates to age, health, education, years of experience with the mental health system, factual knowledge, family empowerment, and service utilization. The instruments require additional development and testing to further refine and measure mental health literacy among caregivers and providers. In addition, a measure should be developed for and administered to the non-native, Spanish-speaking population.

Background

Among the many ways healthcare service and delivery has changed in recent years, perhaps the most important is the evolving role of the patient-consumer. The increasingly long-term, chronic nature of more prevalent diseases (e.g., hypertension, asthma, diabetes), as well as developments in medicine and information technology, have given patients a greater incentive and ability to be more informed, educated, and active participants in maintaining their own health by making choices that will best meet their needs. The heightened attention to the role of consumer health literacy and knowledge is reflected in the specific objectives of Healthy People 2010, a campaign to elevate the health status of Americans by the end of the decade (U.S. Department of Health and Human Services, 2000). However, despite these and similar initiatives, the mechanisms by which more informed and active healthcare consumers might improve health outcomes or drive better service access and quality are only beginning to be understood.

There has been a growing consensus on the importance of involving consumers in making decisions about their own mental healthcare (World Health Organization, 1990). In the area of child mental and emotional health, this view has manifested in the development of “system of care” (SOC) principles that emphasize individualized, family-focused, community-based, and culturally competent care (Stroul & Friedman, 1986). Recent surveys, however, indicate that large segments of the public have low mental health literacy, reflected in a lack of knowledge about symptoms of mental disorders, meanings of psychiatric terms, and the effectiveness of various modes of treatment (Jorm, 2000). This raises the question of whether a SOC approach to mental and emotional health is sufficient to meet the needs of consumers if they lack the knowledge of how to satisfy these needs. Researchers estimate that between 17% and 22% of children under age 18 have been diagnosed with some form of mental illness, and mental illness has been recognized as a major cause of childhood disability. Almost 7 million children between 9 and 17 years old are confronted with severe emotional disturbances (SED) (Faenza & Steel, 1999; Halfon & Newacheck, 1999). Thus, the costs of low mental health literacy in the area of children’s mental health are not likely to be insubstantial.

No research has been conducted to date on health literacy or mental health literacy among caregivers of children with SED, emotional or behavioral disorders, or mental illness. In addition, no instrument has been developed to measure mental health literacy among caregivers or providers.

Review of the Literature on Health Literacy

When defining health literacy, there are several definitions and characteristics that are seen repeatedly throughout the research literature. In the United States, the meaning of health literacy has followed the traditional definition of literacy, i.e., an individual’s ability to read, write, and comprehend words and phrases (Nutbeam, 2000; Parker, 2000; DeWalt et al., 2004). In contrast, in other English-speaking countries such as Great Britain and Australia, health literacy has

been more broadly defined and includes not only an individual's functional ability to read, write, and comprehend medical terms, but also the ability and knowledge to use health and medical information to promote and maintain physical health (DeWalt et al., 2004; Jorm, 2000; Nutbeam, 2000; Parker, 2000; Parker et al., 2003; Watters, 2003).

Behavioral or mental health literacy definitions have variously included factors such as knowledge about mental disorders; beliefs and attitudes about mental disorders that promote appropriate help-seeking; the ability to recognize specific disorders; knowledge of how to obtain mental health information and treatment; and knowledge of risk factors, causes, and treatment of mental disorders (Fisher & Goldney, 2003; Jorm, et al., 1997; Lauber et al., 2005; Marie, Forsyth, & Miles, 2004). Mental health literacy is typically defined as "the public's knowledge and the beliefs about mental disorders enhancing the ability to recognize specific disorders" (Lauber et al., 2003, p. 248), coupled with the ability to access, understand, and use information to recognize and manage disorders (Lauber et al., 2003). Thus, in addition to looking at functional, interactive, and critical dimensions of literacy, the definition of mental health literacy also acknowledges the role that beliefs play in the recognition, prevention, and management of mental disorders (Goldney et al., 2002). Parlslow and Jorm (2002) suggest adopting a model that acknowledges the role of knowledge, beliefs, and attitudes in reinforcing and enabling health-related behaviors.

Studies on the relationship between general health literacy and health service utilization (Baker et al., 1997; Gordon et al., 2002), and more specifically, patient knowledge and service utilization (Kenkel, 1990; Hsieh & Lin, 1997; Parente, Salkever, & Da Vanzo, 2005; Smith, 2005) have found both a positive and negative relationship. The 2006 research (Smith, Armstrong, & Davis, 2006) conducted by FMHI incorporated a theoretical model developed by Smith (2005) that offered an explanation to justify both results, which was based on whether patient and provider knowledge were substitutes or complements in the production of health. The findings of the FMHI research, which used a proxy measure (educational attainment) for mental health literacy, suggested a positive relationship at relatively low levels of mental health literacy (i.e., patient and provider knowledge as complements), but a negative relationship at relatively high levels of mental health literacy (i.e., substitutes).

In addition to the problems attributed to low levels of health literacy, there are also problems associated with cultural competence between healthcare providers and racial and ethnic minorities, such as: low levels of trust between and among people of difference races, classes, and cultural and ethnic groups in this country; fear of the unknown, of differences, and of looking stupid; lack of flexibility; an unwillingness to accept different perspectives; a need for comfort and familiarity; and an unwillingness on the part of those with social power to yield that power (DeCarolis, 2005; Lynch, 1998; Ramsey & Derman-Sparks, 1992). Thus, any assessment of health literacy among racial and ethnic minorities must take into consideration the issue of cultural competence. Moreover, any treatment of cultural competence must avoid the danger of taking an aggregate approach in

viewing racial and ethnic minorities by ignoring differences within groups of people and assuming that all minorities are the same (Ehrlich & Feldman, 1977).

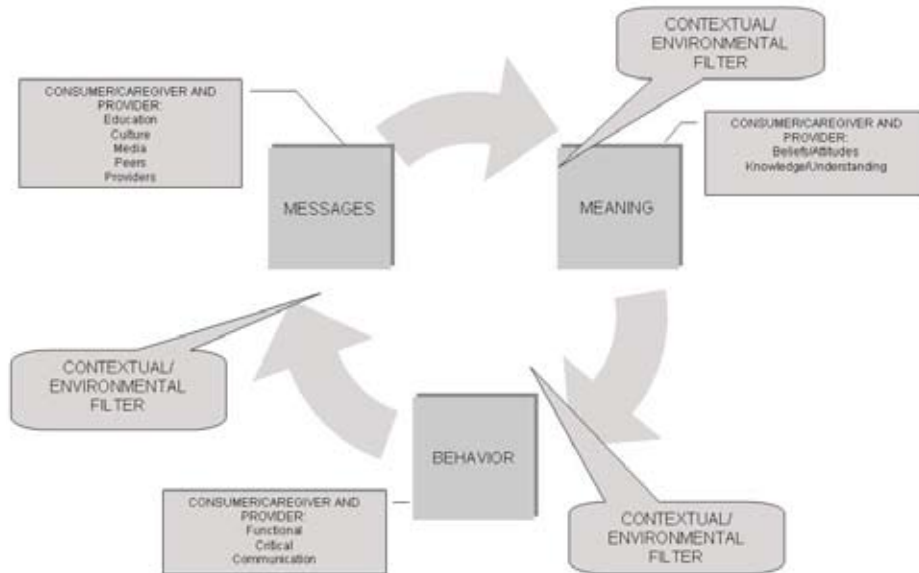
Study Issues

In the 2006 research (Smith, Armstrong, & Davis 2006) conducted by FMHI, there was an exhaustive review of the literature to look for variables and concepts that are key elements of mental health consumer knowledge, understanding, comprehension, and empowerment. This list of variables was then refined through eight focus groups in Hillsborough County, Florida with: (1) mental health care consumers, (2) caregivers of children with Severe Emotional Disturbances (SED), (3) mental health care providers (therapists, social workers, case managers, school social workers or guidance counselors, special education teachers), and one in-depth interview with a psychiatrist providing services to caregivers, children, families, and adults, .

Based on this first phase of the research, a conceptual model of mental health literacy was proposed based on a communication model of information-processing and interpersonal communication. This model includes a patient/caregiver component and a provider component. In this model (see Figure 1 below), mental health literacy is a circular process that includes messages about mental health derived from sources such as training, education, culture, media, peers, patients, and providers. These messages are filtered through contextual and environmental factors through a process by which healthcare consumers and providers attach meaning to them. Meaning is translated into beliefs and knowledge, which are filtered again through contextual and environmental factors. Consumers and providers take these attitudes and beliefs and translate them into behaviors: critical behaviors (making decisions about care, diagnosing and labeling, etc.); functional behaviors (writing and filling prescriptions, making appointments, etc.); and interactional behaviors (sharing symptoms and diagnoses, discussing treatment options, etc.). These behaviors (after being refiltered through contextual and environmental factors) then become feedback and messages themselves in the circular interactional process of health communication. In this model, mental health literacy is defined as the ability to use messages to create meanings in such as way they result in behaviors helpful to a mental healthcare consumer's mental health and well being.

Figure 1
Mental Health Literacy Model.

MENTAL HEALTH LITERACY: The ability to use messages to create meanings such that they result in behaviors that are helpful to a consumer's mental health and well-being.



The conceptual model was incorporated this year into the drafting and validation of an instrument to measure mental health literacy among mental healthcare consumers (caregivers) and providers. Thus, three general questions were addressed:

Q1: Can caregivers' and providers' mental health literacy and knowledge be measured in a way that is valid and reliable?

Validation testing of the instrument yields several specific hypotheses:

Hypotheses:

1. Mental health literacy as measured by the proposed instrument will be stable over time (e.g., over two waves of research).
2. The proposed instrument will have internal consistency (e.g., the items in the scale will consistently measure the same concept).
3. The proposed instrument will have predictive validity, such that mental health literacy as measured by the proposed instrument will be positively related to an outcome variable related to literacy--family empowerment (as measured by the Family Empowerment Scale).
4. The proposed instrument will have construct validity, such that mental health literacy as measured by the proposed instrument will be positively related to the length of receipt of mental health services (e.g., caregivers with more service experience will be more literate).
5. The proposed instrument will have construct validity, such that mental health literacy as measured by the proposed instrument will be positively related to the education level of caregivers (e.g., caregivers with more education will be more literate).

Q2: How does a constructed measure of mental health literacy, based on an initial caregiver survey instrument developed in this study, perform in a statistical model of mental health care utilization?

Q3: What is the role of language and culture in health literacy among non-native, Spanish-speaking caregivers and their providers?

Research Question 1:

Can caregivers' and providers' mental health literacy and knowledge be measured in a way that is valid and reliable?

Methods

In the 2006 AHCA study, we performed an exhaustive content analysis of relevant literature to discover variables and concepts that are key elements of mental health consumer knowledge, understanding, comprehension, and empowerment. We also conducted focus groups with caregivers of children with SED and mental health care providers (therapists, social workers, case managers, school social workers or guidance counselors, special education teachers) to investigate what a caregiver of a child with serious mental health problems needs to know and understand to be an empowered consumer and have access to high quality mental health care. The focus group research, combined with the content analysis, yielded a list of mental health knowledge and literacy variables. These variables were combined and refined to draft two instruments to measure caregiver and provider mental health literacy. The variables were first refined by gathering in-depth feedback from children's mental health researchers, providers, and caregivers.

From that feedback, a caregiver instrument was drafted that included 68 items on a 5-point Likert scale (ranging from Agree Strongly to Disagree Strongly). Also included was an additional sub-scale called "Factual Knowledge" that was comprised of 10 true/false statements testing factual knowledge of mental health information.

Below is a listing of the sub-scale domains and the number of questions in each domain for the caregiver instrument:

- Belief in Capabilities (10 questions),
- Belief in Rights (9),
- Belief in Own Value (5),
- Knowledge/Understanding (16),
- Functional Behaviors (10),
- Critical Behaviors (11),
- Communication Behaviors (7).

The provider instrument included 39 5-point Likert items (ranging from Agree Strongly to Disagree Strongly), plus nine true/false (Agree/Disagree/Not Sure) Factual Knowledge items, and a nine-item Communication Literacy Behavior items sub-scale (e.g., "How often do you use plain language, free of jargon").

The provider instrument included the following sub-domains and number of questions in each sub-domain:

- Belief in Capabilities (8)
- Belief in Rights (9)
- Belief in Value (2)
- Knowledge/Understanding (4)
- Functional Behaviors (5)
- Critical Behaviors (6)
- Communication Behaviors (5)

Each instrument was administered specifically to caregiver or provider participants over two waves of research. In addition to the scale items, demographic data were also collected, as shown in Table 1.

Table 1
Demographic Data Collected by Caregiver and Provider Instruments

Caregivers	Providers
Age	Length of experience
Education level	Education level
Employment status	Position in agency
Race	Agency type
Ethnicity	Consumer type served (Adult/child/caregiver)
Marital status	Payment type received
Years receiving service	
General health	

During the first caregiver interview only, the Family Empowerment Scale (Koren, DeCehillo, & Friesen, 1992) was also administered to gather data on variables that may also relate to literacy.

Participants

Our research site was Hillsborough County, Florida, a system of care site that recently completed their system of care grant funded by the Child and Family Branch of the Center for Mental Health Services (CMHS) in the Federal Substance Abuse and Mental Health Services Administration (SAMHSA). This community serves youth age 0–21 in Hillsborough County who have been diagnosed with SED, either by the school system according to their behavioral criteria or by a psychologist according to a DSM-IV diagnosis.

Participants were recruited through local mental health care providers. IRB guidelines were followed as mandated for human participants involved in research studies. Caregivers were paid \$25 per wave for their participation. Provider participants were not paid.

Sample Size and Data Collection

Data collection consisted of two waves, 2-4 weeks apart, of surveys with 105 caregivers (parents or legal guardians of youth age 0-21 who have been diagnosed with SED) in the first wave, and 38 second interviews from among the same caregivers in the second wave. Two waves of interviewing were also conducted, 2-4 weeks apart, with 28 (wave 1) and 8 (wave 2) providers of children's mental health services (professionals who provide mental health services to children and families such as therapists, social workers, or case managers).

Findings

To be a good measurement of caregiver and provider mental health literacy and knowledge, the proposed instruments must meet the following conditions: internal validity; predictive validity; and reliability; and it must relate to the three domains of functional, interactive, and critical health literacy. Appendix A lists the statistical tests to ensure these conditions and address our hypotheses.

The caregiver instrument was shown have test-retest reliability, and high internal consistency (which shows that items consistently measure the same concept) for all sub-domains except "Belief in Own Value."

The sub-domain of "Factual Knowledge" had low internal consistency, indicating that a respondent may have knowledge about one question concerning mental health, but may not have knowledge about another question. However, there was a small amount of consistency (directionally significant but not statistically significant) between the level of knowledge the respondent had and the level of knowledge they think they have ($p = .059$).

When looking at the number of years of experience a respondent had, there was no statistically significant relationship between the overall literacy score and the number of years a participant received services. There was also no statistically significant relationship between the number of years receiving services and the overall Factual Knowledge score or between number of years receiving services and any of the sub-domain questions.

While education of the caregiver may seem to be a good indicator of mental health literacy, education was found to have a negative statistically significant relationship with the overall literacy score ($p = .024$). In fact, twelve different questions were found to have a negative relationship with the level of education indicated by the respondent. Details of the statistical results are shown in Appendix B.

The caregiver instrument was revised during the analysis so that the desired instrument would represent the same sub-domains, but utilize fewer questions. Questions were selected that contributed to the overall internal consistency of each sub-domain, and the items that had the most negative effect on the overall alpha reliability estimate were deleted. The "Belief in Own Value and "Belief in Capabilities" sub-scales were combined. The revised scale reduction process is shown in Appendix C. Once the caregiver instrument was reduced to include 28 questions, it had a statistically significant relationship with the Family

Empowerment Scale and a negative relationship with the education level of the caregiver, but not the years of receiving services.

The Cronbach's Alpha reliability estimate for the total 39-item provider instrument is .884 and .803 for the Communication Behavior sub-scale, indicating strong internal consistency. At this time, the sample size is too small to compute a reliability estimate on the Factual Knowledge or the other sub-scales. Future research will further refine and shorten the provider instrument.

Research Question 2:

How does a constructed measure of mental health literacy, based on an initial caregiver survey instrument developed in this study, perform in a statistical model of mental health care utilization?

Methods

The mental health care utilization model was described and tested in the 2006 AHCA study (Smith, Armstrong, & Davis, 2006). Therefore, the primary change from last year is the replacement of the proxy variable that was used to measure mental health literacy (educational attainment) with the measure based on the instrument administered to the caregivers of children with severe emotional disturbances.

The settings for research question 2 are AHCA designated Medicaid Districts (or Areas) 1 and 6. Area 1 consists of the state's four most western counties: Escambia, Okaloosa, Santa Rosa, and Walton. Area 6 consists of five counties in the central region of the state near Tampa Bay: Hardee, Highlands, Hillsborough, Manatee, and Polk. The population sample includes Medicaid eligible, non-elderly adult consumers, age 21 to 66 and enrolled in the Prepaid Mental Health Program (PMHP). The PMHP is a managed behavioral health program in which recipients receive inpatient and outpatient mental health services from a designated behavioral health organization that receives a capitated payment from the state.

Subjects in the sample of PMHP enrollees were respondents to the 2002 (Area 6) and 2003 (Area 1) Florida Health Services Survey (FHSS). This is an annual survey conducted by the Louis de la Parte Florida Mental Health Institute of a subset of Medicaid enrollees in particular AHCA districts. The survey obtains information on self-reported physical and mental health and experiences with Medicaid-funded health services. For this study, data were linked from the FHSS with Fiscal Year (FY) 2001-2002 (Area 6) and 2002-2003 (Area 1) Florida Medicaid claims to obtain a data set consisting of information on individual characteristics, health status, and behavioral health service utilization. These data were then pooled into two distinct samples, with the final sample consisting of 715 enrollees (382 from Area 1 and 333 from Area 6).

Analysis

As mentioned, this model was described and tested in a previous study (Smith, Armstrong, & Davis, 2006), so the primary change was that the proxy variable used in the service utilization model last year was replaced with the overall mental

health literacy score, a measure based on the instrument administered to the caregivers of children with severe emotional disturbances.

Applying the method of ordinary least squares, this scored measure of mental health literacy was regressed against a set of covariates that have been shown to be determinants of consumer health knowledge (Kenkel, 1990; Hsieh & Lin, 1997). These covariates included education, gender, race/ethnicity, age, marital status, employment status, and health status. Using the estimated coefficients from this auxiliary regression, a projected measure of mental health literacy was calculated for each observation in the larger Medicaid data. This measure was then inserted into the service utilization model to replace the proxy variable (educational attainment) used in the model last year.

Findings

Education, age, and health status were significant determinants of overall mental health literacy in the auxiliary regression. In particular, there is a decrease in mental health literacy as educational attainment increases. In addition, the younger (less than 40 years old) tend to be more literate than older members of the population, and those with a low (fair or poor) level of self-reported health are generally less literate than those in relatively good health.

Education is also a significant determinant of the Factual Knowledge measure of mental health literacy. Positive statistical significance occurs with the highest category, "College," which suggests that individuals who are more readily able to acquire knowledge in general are also able to acquire higher levels of mental health knowledge. In addition, non-White racial groups tend to have lower levels of mental health knowledge than White members of the population. The reason for this is not clear, although this factor may reflect cultural differences among racial groups regarding attitudes about, and thus exposure to, mental health care issues. There is, however, very little consistency in the results between the Factual Knowledge and overall measure of mental health literacy.

In the service utilization analysis, a logistic model was used to estimate the probability that an eligible PMHP Medicaid recipient uses any non-acute behavioral health services during a 12-month period. Using the projection of the revised (28-item) overall measure of mental health literacy based on the auxiliary regression, the results show that holding all other characteristics of consumers constant at their mean values, the average number of visits falls from 9 visits per year for respondents with low literacy to 5 visits per year for respondents with high literacy. This compares to a baseline average of 8 visits per year for the entire sample. See Appendix D for analytical details.

Research Question 3:

What is the role of language and culture in health literacy among non-native, Spanish-speaking caregivers and their providers?

Methods

In Florida, Hispanic/Latinos made up 16.8% of the total state population in 2000. Hispanic/Latino population in selected Florida counties is outlined in Table 2.

Table 2
Hispanic/Latino Population in Selected Florida Counties

Florida County	Hispanic/Latino Population (U.S. Census Bureau, 2000)
Hillsborough	184,917 (18% of county population)
Polk	46,811 (9.5% of county population)
Highlands	10,766 (12.1% of county population)
Hardee	9,553 (35.7% of county population)
Florida State Total	2,754,615 (16.8% of state population)

Following a process of ‘decentering’ suggested by Weidmer, Brown & Garcia (1999), a review of the literature was completed to understand and describe the variables and concepts that are key elements of culture within our model of mental health literacy. This understanding was further refined using a focus group of Latino/a caregivers of children with SED in Hillsborough County, Florida in March 2006.

Participants were recruited by mental healthcare providers, who gave staff members and patients/clients an invitation letter. Participants were read the informed consent forms prior to participating in the group process. Participants were paid \$25 for their participation. The group was co-facilitated by two native-Spanish speaking moderators. Six people attended the meeting, five women and one man. Four of the women were originally from Mexico, and the other two were from Puerto Rico. They had all been living in Florida for more than a year, and all are caregivers of children diagnosed with SED.

The discussion lasted approximately 90 minutes, was based on information derived from our previous research, and included a synthesis of (1) the literature and focus groups with non-Latino/a caregivers and providers, (2) a quantitative exploration of mental health literacy among non-Latino/a caregivers and providers, and (3) a synthesis of the literature of culture and cultural competence. The cultural and linguistic competence synthesis centered on what adult mental healthcare consumers, caregivers, and providers need to know, understand, believe, and are able to do to provide the best possible care for themselves, their families, and their Latino/a patients and clients.

The focus group was audio-taped, transcribed, and translated into English. The English transcript was analyzed using a constructivist approach to grounded theory (Charmaz, 2000; Glaser and Strauss, 1967; Strauss and Corbin, 1990),

using a line-by-line, systematic coding of data to yield findings based on observed patterns and themes. The line-by-line codes were translated into broad themes, which were then collapsed into themes and concepts that best addressed the research questions. In this report, observed categories are substantiated by illustrative comments from the focus group (translated into English).

Findings

Hispanic/Latinos' healthcare challenges include a struggle with a lack of access to health information in Latino communities, illiteracy and inability to speak English, illegal immigrant status that hinders economic opportunities, discrimination, apathy, denial of certain illnesses, and a cultural stigma associated with many physical and mental illnesses (Campo, 1999; Wagner, 1999).

A lack of familial and social support in this country is a source of difficulty among Latino/a focus group participants:

“I have been very much negatively affected. The fact of being here, with nobody to help us, just my children and my husband. We don't know anybody here.”

Focus group participants stated difficulties in obtaining information about their child's problems and about the available services and supports. A lack of access to care seems to also be due to a lack of medical insurance:

“We had a lot of problem in order to find this program. We had a hard time finding information, there is no place that gives you information.”

“The social worker did not inform us about those services.”

“The first year he had Medicaid, he had a private pediatrician, and until the first year he didn't present any problem. The pediatrician would check him often and he was perfectly well and since the first year that his Medicaid elapsed, we couldn't find any insurance, because the insurances are very expensive and my husband doesn't make too much money. If he would grab a family plan at work they would deduct too much from his pay check and we wouldn't have enough to cover our weekly expenses, and the boy stay without any medical insurance. So I had to change pediatricians, and I grab one from a clinic that cost us \$15 a visit, and every time that we went to an appointment we would tell her that there was something wrong with our son, because he wouldn't talk or say any word according to his age. But they never pay attention to us.”

“There are many Hispanic families that can't have medical insurance and their children and don't know where to go, and if their children have problems and did know about this program it would be better because they help us here and give us a little more help with transportation.”

Clearly explaining a child's problems to a minority parent is important, and a lack of understanding results in delayed care:

“This program helped me realize the problems that my child had.”

“This is the first time that a social worker visits me. My boy has been having behavioral problems since he was 6 years old. They had told me about the program but I didn’t know anything about it, until I found out, and they are helping me.”

Cultural differences can also result in patients/clients misunderstanding communication efforts of providers. For example, Flores, Abreu, Olivar, and Kastner (1998) note that Latino/a patients expect physicians to have the same attitudes and interpersonal behaviors of the physicians in their home country (positive attitude toward the patient, use of terms of respect, and active listening to emotional concerns), and when they do not they form negative perceptions of the healthcare providers. Culturally-based interpersonal assumptions on the part of both patients and healthcare providers can certainly affect their therapeutic relationship (Sharf, 1993). Focus group participants reinforced this idea when they stated that they perceived better care in their home country:

“In Puerto Rico I had better treatment than here. . . We received better help and service.”

Of course, language barriers are a large challenge in cross-cultural health communication. Simply providing health communication materials or healthcare services in a person’s dominant language (referred to as ‘linguistic accessibility’) is the least a healthcare provider can do (Kreuter & McClure, 2004). However, language translation alone does not account for social and cultural message contexts. One solution is to provide a language interpreter, but this solution often has the challenges of unavailability, lack of training and thus lack of competence, lack of understanding on the part of the provider on how to use the interpreter, and lack of understanding on the part of the provider of the patient’s cultural background (Baker, Hayes, & Fortier, 1998). Baker et al. (1998) found that patients who communicated through an interpreter reported less understanding and communication satisfaction and lower compliance than those who communicated directly with their provider. Focus group participants reinforced this opinion:

“I would much rather have no interpreter. It doesn’t matter the trust, I need to understand or I get exasperated.”

Finding and having access to providers that speak Spanish and are familiar with the Latino/a culture (rather than only the language) was a challenge cited by focus group participants. This availability was a key source of satisfaction to parents when it occurred.

“There was a problem communicating. . . Sometime they call someone that speaks Spanish but other times they tell me there is no one even when I know there is, but I keep insisting and don’t give up.”

“I’m also satisfied. The person speaks good Spanish and English.”

“We are very happy with [the case management agency]. . . . They have the same culture, are nice and make you feel like you are dealing with family.”

“No problem with communication, because the people here are knowledgeable and can communicate.”

Many culturally and linguistically diverse clients need functional assistance. The most common type of assistance cited in the focus group was assistance with transportation:

“Let’s say they had talked to me, but I didn’t know where they were, and my problem is transportation.”

“When I need something, they [case management agency] will take me.”

“We are a lot of people in need of transportation.”

“The majority of families don’t drive or there is only one car, and the husband has to go to work and can’t afford to lose one day because they don’t make much money.”

From the results of the focus group among Spanish-speaking caregivers, an additional set of questions would be added to the caregiver instrument. The suggested Spanish-language version of the caregiver instrument (shown in Appendix C) would also include an additional sub-scale to address these cultural issues.

Cultural Competence Behaviors:

- I am able to find and use extended family and social support to give me help when I need it.
- I understand how the mental health system operates (rules, regulations, etc.)
- I know how to find out information about available services.
- I know how to pay for mental healthcare services for my child or family.
- I understand the communication differences between my provider and me (the way we talk, the way we use gestures, etc.)
- I understand how the beliefs and customs of my healthcare provider compare with my own beliefs and customs.

The scale will be translated into Spanish using a back translation approach. Weidmer, Brown, & Garcia (1999), in addition to suggesting the process of ‘decentering’ when translating a survey instrument into Spanish, also suggest another approach called ‘back translation’ in which the English instrument is translated into Spanish and then translated back into English by a second translator (‘blind back translation’). Discrepancies that are pinpointed will be resolved by the research committee.

Conclusion

The refinement of the instrument measuring caregiver mental health literacy resulted in a 28-item scale that showed strong internal reliability representing six conceptual sub-domains that relate to the education level of caregivers and caregiver empowerment.

The results of the empirical model on utilization of non-acute behavioral health services offer some support to the validity of the overall measure of mental health literacy even at this early stage of its development. In particular, replacing the proxy measures of mental health literacy used in the previous study with the overall measure of mental health literacy in estimating the number of non-acute behavioral health care visits produced remarkably similar results. In addition, while the results using the measure of mental health literacy did not generally compare with results using the alternative Factual Knowledge measure, it is important to point out that these two measures largely reflect different cognitive domains of the mental health care consumer, and that in fact mental health literacy encompasses a much broader set of consumer characteristics than only knowledge.

In addition, development of a Spanish-version of a scale measuring caregiver mental health literacy that represents the original six conceptual sub-domains plus an additional cultural competence sub-domain is recommended. This revised model of caregiver mental health literacy extends the original conceptual model representing message-meaning-behavior to a cultural competence version that acknowledges the importance of culture on the other dimensions. This scale, based on a process of ‘decentering’ utilizing a literature review and focus group methodology, reflects cultural issues experienced by Latino/a and Hispanic mental healthcare caregivers of children with SED, including issues of access to healthcare, access to information, access to insurance or other methods of paying for healthcare, understanding the mental healthcare system, and understanding how the cultural background of the system and providers affect their interactions with caregivers.

Limitations of the Analysis

Having a larger sample size for the caregiver and provider results would improve the analysis and add to the validation of the instruments. Future research will further refine and shorten the instruments and increase the sample size for analysis.

For the service utilization analysis, the most serious limitation of the analysis is that the projection, or construction, of mental health literacy that was based on a survey of caregivers of children was used to estimate the utilization behavior of adult mental health care consumers. While data limitations prevented us from being consistent in our sample populations, it is quite likely there are significant differences in how mental health literacy is (or should) be defined for caregivers and for adult mental health care consumers. Thus, our results should accordingly be viewed with some caution.

The limitation to focus group findings is that results are not generalizable and this study had a low sample size. Also, the translated results are subject to the accuracy of the translation.

References

- Baker, D. W., Parker, R. M., Williams, M. V., Clark, W. S., & Nurss, J. R. (1997). The relationship of patient reading ability to self-reported health and use of health services. *American Journal of Public Health, 87*, 1027-1030.
- Baker, D. W., Gazmararian, J. A., Williams, M. V., Scott, T., Parker, R. M., Green, D., Ren, J., & Peel, J. (2004). Health literacy and use of outpatient physician services by Medicare managed care enrollees. *Journal of General Internal Medicine, 19*, 215-220.
- Baker, D. W., Gazmararian, J. A., Sudano, J., Patterson, M., Parker, R. M., & Williams, M. V. (2002). Health literacy and performance on the Mini-Mental State Examination. *Aging and Mental Health, 6*(1), 22-29.
- Baker, D. W., Hayes, R., & Fortier, J. P. (1998). Interpreter use and satisfaction with interpersonal aspects of care for Spanish-speaking patients. *Medical Care, 36*, 1461-1470.
- Campo, R. (1999). Does Silencio = Muerte? Notes on translating the AIDS epidemic. *The Progressive, 20-23*.
- Charmaz, K. (2000). Grounded theory: Objectivist and Constructivist methods. In N. K. Denzin & Y. S. Lincoln (Eds.), *Handbook of Qualitative Research* (pp. 509-535). Thousand Oaks, CA: Sage Publications.
- DeCarolis, G. (2004, Winter). Reflections on cultural competence. *Center for Community Leadership Leaders' Edge Advisor, 1*(3), 1-2.
- DeVellis, R. F. (2003). *Scale development: Theory and applications*. Thousand Oaks, CA: Sage Publications.
- DeWalt, D. A., Berkman, N. D., Sheridan, S., Lohr, K. N., & Pignone, M. P. (2004). Literacy and health outcomes: A systematic review of the literature. *Journal of General Internal Medicine, 19*, 1228-1239.
- Ehrlich, P. R., and Feldman, S. S. *The Race Bomb: Skin Color, Prejudice, and Intelligence*. New York: Ballantine, 1977.
- Faenza, M. M., & Steel, E. (1999). Mental health care coverage for children and families. In T. P. Gulotta, R. L. Hampton, G. R. Adams, B. A. Ryan, & R. P. Weissberg (Eds.), *Children's health care: Issues for the year 2000 and beyond* (pp. 117-135). Thousand Oaks, CA: Sage Publications.
- Fisher, L. J., & Goldney, R. D. (2003). Differences in community mental health literacy in older and younger Australians. *International Journal of Geriatric Psychiatry, 18*, 33-40.
- Flores, G., Abreu, M., Olivar, M. A., & Kastner, B. (1998). Access barriers to health care for Latino children. *Archives of Pediatric and Adolescent Medicine, 152*, 1119-1125.
- Glaser, B., & Strauss, A. (1967). *The discovery of grounded theory*. Chicago, IL: Aldine.
- Goldney, R. D., Fisher, L. J., Wilson, D. H., & Cheok, F. (2002). Mental health literacy of those with major depression and suicide ideation: An impediment to help seeking. *Suicide and Life-Threatening Behavior, 32*(4), 394-403.
- Gordon, M. M., Hampson, R., Capell, H. A., & Madhok, R. (2002). Illiteracy in rheumatoid arthritis patients as determined by the Rapid Estimate of Adult Literacy in Medicine (REALM) score. *Rheumatology, 41*, 750-754.
- Halfon, N., & Newacheck, P. W. (1999). Prevalence and impact of parent-reported disabling mental health conditions among U.S. children. *Journal of the American Academy of Child and Adolescent Psychiatry, 38*, 600-608.

- Hsieh, C., & Shin-Jong, L. (1997). Health information and the demand for preventive care among the elderly in Taiwan. *The Journal of Human Resources*, 32(2), 308-33.
- Hugo, C. J., Boshoff, D. E., Traut, A., Zungu-Dirwayi, N., & Stein, D. J. (2003). Community attitudes toward and knowledge of mental illness in South Africa. *Social Psychiatry Psychiatric Epidemiology*, 38, 715-719.
- Jorm, A. F. (2000). Mental health literacy: Public knowledge and beliefs about mental disorders. *British Journal of Psychiatry*, 177, 396-401.
- Jorm, A. F., Christensen, H., & Griffiths, K. (2005). The impact of beyondblue: The national depression initiative on the Australian public's recognition of depression and beliefs about treatments. *Australian and New Zealand Journal of Psychiatry*, 39, 248-254.
- Jorm, A. F., Korten, A. E., Jacomb, P. A., Christensen, H., Rodgers, B., & Pollitt, P. (1997). "Mental health literacy": A survey of the public's ability to recognize mental health disorders and their beliefs about the effectiveness of treatment. *Medical Journal of Australia*, 166, 182-186.
- Kenkel, D. (1990). Consumer health information and the demand for medical care. *The Review of Economics and Statistics* 72(4), 587-95.
- Koren, P. E., DeChillo, N., & Friesen, B. J. (1992). Measuring empowerment in families whose children have emotional disabilities: A brief questionnaire. *Rehabilitation Psychology*, 37, 305-321.
- Kreuter, M. W., & McClure, S. M. (2004). The role of culture in health communication. *Annual Review of Public Health*, 25, 439-455.
- Lauber, C., Ajdacic-Gross, V., Fritschi, N., Stulz, W., & Rossler, W. (2005). Mental health literacy in an educational elite- an online survey among university students. *BMC Public Health*, 5(44). Retrieved June, 21 2007, from <http://www.biomedcentral.com/1471-2458/5/44>
- Lauber, C., Nordt, C., Falcato, L., & Rossler, W. (2003). Do people recognize mental illness? Factors influencing mental health literacy. *European Archives of Psychiatry and Clinical Neuroscience*, 253, 248-251.
- Lynch, E. W. & Hanson, M. J. (Eds.) (2004). *Developing cross-cultural competence: Working with young children and their families (3rd ed.)*. Baltimore: Paul H. Brookes Publishing Co.
- Marie, D., Forsyth, D. K., & Miles L. K. (2004). Categorical ethnicity and mental health literacy in New Zealand. *Ethnicity & Health*, 9(3), 225-252.
- Nutbeam, D. (2000). Health literacy as a public health goal: A challenge for contemporary health and education and communication strategies into the 21st century. *Health Promotion International*, 15(3), 259-267.
- Parente, S. T., Salkever, D. S., & DaVanzo, J. (2005). The role of consumer knowledge of insurance benefits in the demand for preventative health care among the elderly. *Health Economics*, 14, 25-38.
- Parker, R. (2000). Health literacy: A challenge for American patients and their health care providers. *Health Promotion International*, 15(4), 277-283.
- Parker, G., Mahendran, R., Yeo, S. G., Loh, M. I., & Jorm, A. F. (1999). Diagnosis and treatment of mental disorders: A survey of Singapore mental health professionals. *Social Psychiatry and Psychiatric Epidemiology*, 34(10), 555-563.
- Parker, R. M., Ratzan, S. C., & Lurie, N. (2003). Health literacy: A policy challenge for advancing high-quality health care. *Health Affairs*, 22(4), 147-153.
- Parker, R. M., & Gazmararian, J. A. (2003). Health literacy: Essential for health communication. *Journal of Health Communication*, 8, 116-118.

- Parlslow, R. A., & Jorm, A. F. (2002). Improving Australians' depression literacy. *Medical Journal of Australia*, 177, S117-121.
- Ramsey, P., & Derman-Sparks, L. (1992). Viewpoint. Multicultural Education Reaffirmed. *Young Children*, 47(2), 10-11.
- Sharf, B. F. (1993). Reading the vital signs: Research in healthcare communication. *Communication Monographs*, 60, 35-41.
- Smith, R. B. (2005). An alternative perspective on information asymmetry: Implications for consumer authority in physician services markets. *Journal of Economics and Management Strategy*, 14(3), 665-699.
- Smith, R. B., Armstrong, M., & Davis, C. (2006). *The effect of health knowledge and literacy on utilization, cost, service quality, and quality of life in children and adult Medicaid mental health consumers*. Tampa, FL: University of South Florida, Louis de la Parte Florida Mental Health Institute.
- Strauss, A., & Corbin, J. (1990). *Basics of qualitative research: Grounded theory procedures and techniques*. Newbury Park, CA: Sage Publications.
- Stroul, B. A., & Friedman, R. M. (1986, July). *A system of care for children and youth with severe emotional disturbances. (Revised Edition)*. Washington, DC: Georgetown University Child Development Center, CASSP Technical Assistance Center.
- U.S. Department of Health and Human Services. (2000). *Healthy People 2010*. Retrieved June 26, 2007, from <http://www.healthypeople.gov/>
- Wagner, M. (1999). By focusing on family, healthcare moves forward; Rx solution: Hispanic/Latino households most attractive, attentive target with proper in-language approach. *Advertising Age*, 70(36), 16-17.
- Watters, E. K. (2003). Literacy for health: An interdisciplinary model. *Journal of Transcultural Nursing*, 14(1), 48-53.
- Weidmer, B., Brown, J., & Garcia, L. (1999). Translating the CAHPS 1.0 survey instruments into Spanish. *Medical Care*, 37, MS89-MS96.
- Wooldridge, J. M. (2002). *Econometric analysis of cross section and panel data*. Cambridge, MA: The MIT Press.
- World Health Organization. (1990). Meeting on consumer involvement in mental health services. *Psychosocial Rehabilitation Journal*, 14(1), 13-20.

Appendix A: Statistical Analyses Used in Validating Caregiver Instrument

- Test-retest reliability was measured by a paired t-test between scores on each item on the two waves of interviewing (the null hypothesis that there is not a statistically significant difference between the two waves indicates reliability);
- Internal consistency was measured using Cronbach's Alpha to compare items to assure that the rating scales are consistent and that the items in the instruments measure the same concept;
- Using a Spearman's Rho correlation, construct validity was assessed through the contrasted groups approach by comparing mental health literacy and knowledge with two different groupings of caregivers: a) those with more and those with less experience with mental health services, e.g., caregivers with more experience with mental health services would be expected to have higher mental health literacy and knowledge than those with less experience; and b) those with more and those with less education, e.g., caregivers with more education would be expected to have higher mental health literacy and knowledge than those with less education;
- Using a Pearson Product-Moment correlation, predictive validity was assessed by comparing caregiver's mental health literacy/knowledge, as measured by the proposed instruments, to the outcome variable 'empowerment' hypothesized to relate to literacy;
- The number of items in the scale was reduced by selecting those items that contributed to the overall internal consistency of each sub-domain and deleting those items that have the most negative effect on the overall alpha reliability estimate. The principal component factor analysis was used to verify this process of reduction.

For the caregiver instrument, mental health literacy was measured in two ways: by individual scale items and total mental health literacy score. The total mental health literacy score was created by computing a mean of all the individual item scores. A mean was used rather than a sum for the total score to allow missing data left out of an individual score rather than being computed in a way that would be misleading or would skew the data. A score was also created for each of our conceptual sub-scales, so a mean literacy score was created for Belief in Capabilities, Belief in Rights, Belief in Value, Knowledge/Understanding, Functional Behaviors, Critical Behaviors, and Communication Behaviors. In addition, a score was created for overall Factual Knowledge by summing the number of correct answers given to the true/false statements. The Family Empowerment Scale was given an overall summary measure by computing a mean of the responses to all items.

For the provider instrument, a total mental health literacy score was also created by computing a mean of all the individual item scores. In addition, we computed an overall Factual Knowledge score by summing the correct answers and an overall Communication Literacy Behavior score by summing the number of times a behavior was indicated as being performed.

Appendix B: Results from Validating Caregiver Instrument

Full Scale

Reliability: The hypothesis was that mental health literacy, as measured by the instrument, would be stable over two waves of research. In the caregiver instrument, all of the 78 items show statistically significant test-retest reliability. A paired samples t-test shows no statistically significant differences between wave 1 and wave 2 at the 95% confidence level for any of the individual scale items. In addition, a paired samples t-test for the overall mental health literacy score shows no statistically significant difference between wave 1 and wave 2 (see Table B1). On the Factual Knowledge sub-scale, all of the 10 items show statistically significant test-retest reliability. A paired samples t-test shows no statistically significant differences between wave 1 and wave 2 at the 95% confidence level for any of the individual sub-scale items.

Table B1
Paired Samples t-Test

	t	df	Sig. (2-tailed)
BELIEF IN CAPABILITIES			
My child, family, and I have many strengths that enhance our health and well-being	-1.072	30	.292
I am sure that my child will be able to support him/herself when he/she grows up	-.475	31	.638
I am capable of solving my or my family's problems	-1.366	30	.182
I am capable of being a good parent to all my children	-1.000	31	.325
I am capable of making any changes I need to make in order to help my child/family	-1.359	31	.184
The mental, emotional, and/or behavioral problems in my child can be successfully treated	-.387	30	.702
I can control my child's behavior	-1.229	30	.229
Treatment for my family is under my control	-.284	29	.778
Things can get better for my child and family	-.722	31	.476
I can survive the problems my child and family are going through	-.812	29	.423
BELIEF IN RIGHTS			
My child and family have the right to receive testing we need	-.682	31	.500
I have the right to ask for help when I need it	-.297	31	.768

	t	df	Sig. (2-tailed)
I have the right to ask for all available services in the community that my child or family needs	-.594	31	.557
My child has the right to receive an education regardless of his/her problems or needs	-.941	31	.354
I have the right to ask my child's service providers questions about my child's care	.000	31	1.000
I have the right to choose my child's services	-1.880	30	.070
I have the right to be heard by my child's service providers	-.571	30	.572
I have the right to be treated with respect by my child's service providers	-1.793	30	.083
I have the right to question the decisions of my child's service providers	.000	30	1.000
BELIEF IN OWN VALUE			
Having MEB problems does not make my child less valuable to society	-.769	30	.448
MEB in children can be illnesses (not discipline issues)	.000	30	1.000
The opinions of my child are important	.571	30	.572
My opinions are important	-.571	30	.572
Having a mental illness does not make you abnormal	-.725	30	.474
KNOWLEDGE/UNDERSTANDING			
I understand all the terms my service providers use	.387	30	.702
I understand any changes my providers want us to make	-.372	28	.712
I understand the differences between psychologists, psychiatrists, therapists, etc.	-.226	30	.823
There are options other than medications that are available to us	-.701	30	.489
I know what mental health resources and services are available to us	1.270	30	.214
I know how to access all the resources, services and treatments available in this community	-.441	30	.662
I understand the diagnosis given to us by our MH service providers	.312	30	.758
I know what some of the risks are to the treatments recommended by our providers	-.680	30	.502
I know what some of the benefits are to the treatments recommended by our providers	-1.270	30	.214
I understand the role of the school in my child's well-being and development	.304	30	.763
I understand the school's IEP process	.254	30	.801

	t	df	Sig. (2-tailed)
I have a good understanding of what my child/family need	-.812	30	.423
I understand how the DJJ system works	-.532	29	.599
I understand how the DCF system works	-.304	30	.763
I can tell when my child's behavior is a result of MI and when it's a discipline problem	-.348	28	.730
I am a well-informed caregiver for my child	-.528	30	.601
FACTUAL KNOWLEDGE			
A psychiatrist is a medical doctor whereas a psychologist is not	.254	30	.801
A psychiatrist is primarily responsible for counseling (REVERSE CODED)	-1.718	30	.096
The services of a social worker can only be accessed through the MH system (REVERSE CODED)	1.563	30	.129
It is generally more difficult to observe mental disorders in children than adults	1.982	31	.056
Psychotherapy should only be used when medication fails in treating your child's MH condition (REVERSE CODED)	-1.488	31	.147
You should immediately discontinue using any medication that is not working (REVERSE CODED)	-.254	30	.801
All services needed by a child with a SED must be provided for by the school (REVERSE CODED)	-.387	30	.702
My school must provide all MH services that are identified as needed in the IEP	-1.184	31	.245
My child's problems might require treating our entire family	-.701	31	.488
You should avoid any mention of suicide with a child that may be suffering from depression	-.571	30	.572
FUNCTIONAL BEHAVIORS			
I know how to find treatment options for my child/family when necessary	.239	30	.813
I understand how to make an appointment with my providers	-1.293	30	.206
I understand how to obtain the services/resources we need	-.828	30	.414
I understand how to obtain the information we need for our care/well-being	.000	30	1.000
I understand how to fill out the paperwork required by my providers	-1.072	30	.292
I understand how to navigate the insurance/Medicare/Medicaid	.000	30	1.000
I understand how to deal with my child's behaviors that are related to his/her MEB problems	.254	31	.801
I understand how to juggle my child's appointments and activities	-.528	30	.601

	t	df	Sig. (2-tailed)
I understand how to fit our treatments into our life	-.387	30	.702
I understand how to administer medications to my child properly and appropriately	-.441	30	.662
CRITICAL BEHAVIORS			
I am able to make decisions about our care from among differing recommendations and opinions from providers	.273	31	.786
I am able to decide whether or not to agree with the diagnosis	.403	31	.690
I am able to decide when I need to get a second opinion on our care	.626	31	.536
I am able to balance the benefits and side effects of medications to determine whether or not my child should take them	.000	30	1.000
I am able to make placement decisions about my child (residential/school)	.649	30	.522
I am able to decide when I need to switch providers or see an additional provider	.941	31	.354
I am able to decide whether or not the treatments/services provided have worked well enough or not	-.626	31	.536
I am able to decide between competing priorities for my time	-1.000	31	.325
I am able to decide when my family needs help, assistance, or services	.373	31	.712
I am able to know when my child/family needs to make changes in our lives	-1.000	31	.325
I am able to decide when/to whom it is safe to disclose personal child and family information	.239	31	.813
COMMUNICATION BEHAVIORS			
I am capable of describing symptoms with our mental/emotional/ behavioral service providers	-1.680	30	.103
I am capable of asking questions of our service providers	1.359	31	.184
I am capable of expressing concerns to our service providers	1.000	31	.325
I am capable of disagreeing with our service providers	1.072	31	.292
I am capable of negotiating with our service providers to reach treatment or service solutions that are best for everyone	.000	30	1.000
I am capable of communicating with our service providers in all the systems we use (DJJ, DCF, etc.)	1.985	30	.056
I am capable of asking for help, services, treatment, and resources in a way that gets us what we need	.881	30	.385

Internal Consistency: The hypothesis was that the proposed instrument would have internal consistency (e.g., the items in the scale will consistently measure the same concept). Cronbach's Alpha on the total scale (all items) is .952, indicating high internal consistency (as would be expected for a scale with such a large number of items). Cronbach's Alpha on each of the sub-domains is .735 for "Belief in Capabilities," .798 for "Belief in Rights," .525 for "Belief in Own Value," .896 for "Knowledge/Understanding," .867 for "Functional Behaviors," .876 for "Critical Behaviors," and .825 for "Communication Behaviors," – all acceptable levels of internal consistency except for the "Belief in Own Value" sub-domain, according to DeVellis (2003) (see Table B2). On the "Factual Knowledge" sub-scale, Cronbach's Alpha on the total scale (all 10 items) is extremely low (.326), indicating inconsistency in factual knowledge about mental health issues. Knowledge on one item about mental health has no relationship to whether or not a person also has knowledge about another item. However, the "Factual Knowledge" sub-scale is directionally related (but not statistically significantly correlated), with the "Knowledge/Understanding" sub-scale of the mental health literacy instrument ($p = .059$) indicating a slight relationship between the level of knowledge people have and the level of knowledge they think they have.

Table B2
Cronbach's Alpha

Sub-Scale	Cronbach's Alpha	
	Long Version of Scale	Short Version of Scale
Belief in Capabilities	.735	.714 (Combined with "Belief in Own Value")
Belief in Rights	.798	.742
Belief in Own Value	.525	N/A
Knowledge/Understanding	.896	.850
Functional Behaviors	.867	.835
Critical Behaviors	.876	.816
Communication Behaviors	.825	.797
Factual Knowledge	.326	N/A
Overall Health Literacy Scale	.952	.917

Predictive Validity: The hypothesis was that the proposed instrument would have predictive validity; that mental health literacy, as measured by the proposed instrument, will be positively related to an outcome variable related to literacy--family empowerment (as measured by the Family Empowerment Scale). The overall health literacy score is statistically significant (at the 95% confidence level) associated with the Family Empowerment Score, and the Family Empowerment Score is statistically significantly (at the 95% confidence level) associated with 59 of the 78 items (see Table B3).

Table B3
Correlation with Family Empowerment Scale

Correlation With Family Empowerment Scale	Correlation Coefficient;
Significance	
Overall Health Literacy Score	.749 .000**
BELIEF IN CAPABILITIES	
My child, family, and I have many strengths that enhance our health and well-being	.276 .005**
I am sure that my child will be able to support him/herself when he/she grows up	.215 .028*
I am capable of solving my or my family's problems	.488 .000**
I am capable of being a good parent to all my children	.388 .000**
I am capable of making any changes I need to make in order to help my child/family	.359 .000**
The mental, emotional, and/or behavioral problems in my child can be successfully treated	.301 .002**
I can control my child's behavior	.424 .000**
Treatment for my family is under my control	.263 .007**
Things can get better for my child and family	.187 .057
I can survive the problems my child and family are going through	.255 .009**
BELIEF IN RIGHTS	
My child and family have the right to receive testing we need	.100 .311
I have the right to ask for help when I need it	.217 .026*
I have the right to ask for all available services in the community that my child or family needs	.261 .007**
My child has the right to receive an education regardless of his/her problems or needs	.145 .141

Correlation With Family Empowerment Scale	Correlation Coefficient;
I have the right to ask my child's service providers questions about my child's care	.060 .545
I have the right to choose my child's services	.354 .000**
I have the right to be heard by my child's service providers	.216 .030*
I have the right to be treated with respect by my child's service providers	.106 .289
I have the right to question the decisions of my child's service providers	.211 .034*
BELIEF IN OWN VALUE	
Having MEB problems does not make my child less valuable to society	.163 .104
MEB in children can be illnesses (not discipline issues)	.136 .176
The opinions of my child are important	.268 .007**
My opinions are important	.288 .004**
Having a mental illness does not make you abnormal	.176 .078
FUNCTIONAL BEHAVIORS	
I know how to find treatment options for my child/family when necessary	.598 .000**
I understand how to make an appointment with my providers	.169 .089
I understand how to obtain the services/resources we need	.562 .000**
I understand how to obtain the information we need for our care/well-being	.466 .000**
I understand how to fill out the paperwork required by my providers	.355 .000**
I understand how to navigate the insurance/Medicare/Medicaid	.366 .000**
I understand how to deal with my child's behaviors that are related to his/her MEB problems	.396 .000**
I understand how to juggle my child's appointments and activities	.306 .002**
I understand how to fit our treatments into our life	.455 .000**
I understand how to administer medications to my child properly and appropriately	.219 .028*
CRITICAL BEHAVIORS	
I am able to make decisions about our care from among differing recommendations and opinions from providers	.393 .000**
I am able to decide whether or not to agree with the diagnosis	.400 .000**
I am able to decide when I need to get a second opinion on our care	.440 .000**
I am able to balance the benefits and side effects of medications to determine whether or not my child should take them	.331 .001**

Correlation With Family Empowerment Scale	Correlation Coefficient;
I am able to make placement decisions about my child (residential/school)	.276 .005**
I am able to decide when I need to switch providers or see an additional provider	.215 .028*
I am able to decide whether or not the treatments/services provided have worked well enough or not	.488 .000**
I am able to decide between competing priorities for my time	.388 .000**
I am able to decide when my family needs help, assistance, or services	.359 .000**
I am able to know when my child/family needs to make changes in our lives	.301 .002**
I am able to decide when/to whom it is safe to disclose personal child and family information	.424 .000**
COMMUNICATION BEHAVIORS	
I am capable of describing symptoms with our MEB service providers	.263 .007**
I am capable of asking questions of our service providers	.187 .057
I am capable of expressing concerns to our service providers	.255 .009**
I am capable of disagreeing with our service providers	.100 .311
I am capable of negotiating with our service providers to reach treatment or service solutions that are best for everyone	.217 .026*
I am capable of communicating with our service providers in all the systems we use (DJJ, DCF, etc.)	.261 .007**
I am capable of asking for help, services, treatment, and resources in a way that gets us what we need	.145 .141
KNOWLEDGE/UNDERSTANDING	
I understand all the terms my service providers use	.435 .000**
I understand any changes my providers want us to make	.428 .000**
I understand the differences between psychologists, psychiatrists, therapists, etc.	.357 .000**
There are options other than medications that are available to us	.349 .000**
I know what mental health resources and services are available to us	.476 .000**
I know how to access all the resources, services and treatments available in this community	.513 .000**
I understand the diagnosis given to us by our MH service providers	.438 .000**
I know what some of the risks are to the treatments recommended by our providers	.509 .000**
I know what some of the benefits are to the treatments recommended by our providers	.506 .000**
I understand the role of the school in my child's well-being and development	.452 .000**

Correlation With Family Empowerment Scale	Correlation Coefficient;
I understand the school's IEP process	.403 .000**
I have a good understanding of what my child/family need	.534 .000**
I understand how the DJJ system works	.514 .000**
I understand how the DCF system works	.513 .000**
I can tell when my child's behavior is a result of MI and when it's a discipline problem	.577 .000**
I am a well-informed caregiver for my child	.060 .545
FACTUAL KNOWLEDGE	
A psychiatrist is a medical doctor whereas a psychologist is not	-.082 .417
A psychiatrist is primarily responsible for counseling (REVERSE CODED)	-.135 .177
The services of a social worker can only be accessed through the MH system (REVERSE CODED)	.121 .229
It is generally more difficult to observe mental disorders in children than adults	.190 .056
Psychotherapy should only be used when medication fails in treating your child's MH condition (REVERSE CODED)	-.038 .709
You should immediately discontinue using any medication that is not working (REVERSE CODED)	-.001 .991
All services needed by a child with a SED must be provided for by the school (REVERSE CODED)	.085 .400
My school must provide all MH services that are identified as needed in the IEP	.027 .790
My child's problems might require treating our entire family	-.187 .061
You should avoid any mention of suicide with a child that may be suffering from depression	.014 .893

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

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

Construct Validity: The hypothesis was that the proposed instrument would have construct validity; that mental health literacy as measured by the proposed instrument would be positively related to the length of receipt of mental health services (e.g., caregivers with more service experience will be more literate); and that mental health literacy as measured by the proposed instrument would be positively related to the education level of caregivers (e.g., caregivers with more education would be more literate).

According to a Spearman's Rho, at the 95% confidence level there was not a statistically significant relationship between the overall health literacy score and the number of years participants were receiving services. There was, however, a negative statistically significant relationship between years receiving services and the overall "Belief in Capabilities" score ($p = .025$) and the overall "Factual Knowledge" score ($p = .05$), and between experience and 8 of the individual items:

- "I can control my child's behavior" (Belief in Capabilities sub-domain);
- "I understand how to deal with my child's behaviors that are related to his/her mental, emotional, and/or behavioral problems" (Functional Behaviors sub-domain);
- "I am able to decide when my family needs help, assistance, or services" (Critical Behaviors sub-domain);
- "I am able to know when my child/family needs to make changes in our lives" (Critical Behaviors sub-domain); and
- "I am capable of communicating with our service providers in all the systems we use" (Communication Behaviors sub-domain).

There is a positive statistically significant correlation between years receiving services and "I have the right to ask my child's service providers questions about my child's care" (Belief in Rights sub-domain); "My child's problems might require treating our entire family—Agree" (Factual Knowledge sub-domain), and "You should immediately discontinue using any medication that is not working—Disagree" (Factual Knowledge sub-domain) (See Table B4).

Table B4
Correlation with Years Receiving Services

		Years receiving services	Education
My child, family, and I have many strengths that enhance our health and well-being	Correlation Coefficient	.045	.458(**)
	Sig. (2-tailed)	.811	.010
I am sure that my child will be able to support him/herself when he/she grows up	Correlation Coefficient	-.168	.024
	Sig. (2-tailed)	.359	.895
I am capable of solving my or my family's problem	Correlation Coefficient	-.249	-.079
	Sig. (2-tailed)	.170	.666
I am capable of being a good parent to all my children	Correlation Coefficient	-.255	-.316
	Sig. (2-tailed)	.159	.078
I am capable of making any changes I need to make in order to help my child/family	Correlation Coefficient	-.065	-.118
	Sig. (2-tailed)	.723	.518
The mental, emotional, and/or behavioral problems in my child can be successfully treated	Correlation Coefficient	-.311	-.474(**)
	Sig. (2-tailed)	.089	.007
I can control my child's behavior	Correlation Coefficient	-.580(**)	-.142
	Sig. (2-tailed)	.001	.439
Treatment for my family is under my control	Correlation Coefficient	-.114	-.141
	Sig. (2-tailed)	.541	.451
Things can get better for my child and family	Correlation Coefficient	-.039	.034
	Sig. (2-tailed)	.832	.853
I can survive the problems my child and family are going through	Correlation Coefficient	.077	.104
	Sig. (2-tailed)	.680	.578
My child and family have the right to receive testing we need	Correlation Coefficient	.076	.191
	Sig. (2-tailed)	.680	.295
I have the right to ask for help when I need it	Correlation Coefficient	-.004	-.245
	Sig. (2-tailed)	.983	.177

		Years receiving services	Education
I have the right to ask for all available services in the community that my child or family needs	Correlation Coefficient	.276	.256
	Sig. (2-tailed)	.127	.158
My child has the right to receive an education regardless of his/her problems or needs	Correlation Coefficient	.197	.127
	Sig. (2-tailed)	.279	.488
I have the right to ask my child's service providers questions about my child's care	Correlation Coefficient	.355(*)	.360(*)
	Sig. (2-tailed)	.046	.043
I have the right to choose my child's services	Correlation Coefficient	-.165	-.223
	Sig. (2-tailed)	.375	.229
I have the right to be heard by my child's service providers	Correlation Coefficient	-.092	.107
	Sig. (2-tailed)	.624	.567
I have the right to be treated with respect by my child's service providers	Correlation Coefficient	.169	-.055
	Sig. (2-tailed)	.364	.771
I have the right to question the decisions of my child's service providers	Correlation Coefficient	-.111	.146
	Sig. (2-tailed)	.552	.433
Having MEB problems does not make my child less valuable to society	Correlation Coefficient	.316	-.097
	Sig. (2-tailed)	.083	.605
MEB in children can be illnesses (not discipline issues)	Correlation Coefficient	.157	.160
	Sig. (2-tailed)	.400	.391
The opinions of my child are important	Correlation Coefficient	.031	-.181
	Sig. (2-tailed)	.869	.329
My opinions are important	Correlation Coefficient	-.019	-.013
	Sig. (2-tailed)	.918	.947
Having a mental illness does not make you abnormal	Correlation Coefficient	.224	-.126
	Sig. (2-tailed)	.225	.500

		Years receiving services	Education
I understand all the terms my service providers use	Correlation Coefficient	.038	-.062
	Sig. (2-tailed)	.838	.742
I understand any changes my providers want us to make	Correlation Coefficient	.185	-.099
	Sig. (2-tailed)	.320	.598
I understand the differences between psychologists, psychiatrists, therapists, etc.	Correlation Coefficient	-.002	.075
	Sig. (2-tailed)	.990	.687
There are options other than medications that are available to us	Correlation Coefficient	-.166	.084
	Sig. (2-tailed)	.372	.653
I know what mental health resources and services are available to us	Correlation Coefficient	.020	-.047
	Sig. (2-tailed)	.916	.802
I know how to access all the resources, services and treatments available in this community	Correlation Coefficient	-.141	-.163
	Sig. (2-tailed)	.448	.380
I understand the diagnosis given to us by our MH service providers	Correlation Coefficient	-.187	-.298
	Sig. (2-tailed)	.313	.104
I know what some of the risks are to the treatments recommended by our providers	Correlation Coefficient	.070	-.388(*)
	Sig. (2-tailed)	.707	.031
I know what some of the benefits are to the treatments recommended by our providers	Correlation Coefficient	.114	-.260
	Sig. (2-tailed)	.540	.159
I understand the role of the school in my child's well-being and development	Correlation Coefficient	.118	-.371(*)
	Sig. (2-tailed)	.527	.040
I understand the school's IEP process	Correlation Coefficient	.088	-.328
	Sig. (2-tailed)	.636	.071
I have a good understanding of what my child/family need	Correlation Coefficient	-.107	-.581(**)
	Sig. (2-tailed)	.566	.001

		Years receiving services	Education
I understand how the DJJ system works	Correlation Coefficient	-.080	-.508(**)
	Sig. (2-tailed)	.673	.004
I understand how the DCF system works	Correlation Coefficient	-.277	-.532(**)
	Sig. (2-tailed)	.132	.002
I can tell when my child's behavior is a result of MI and when it's a discipline problem	Correlation Coefficient	-.216	-.346
	Sig. (2-tailed)	.243	.057
I know how to find treatment options for my child/family when necessary	Correlation Coefficient	-.147	-.061
	Sig. (2-tailed)	.429	.744
I understand how to make an appointment with my providers	Correlation Coefficient	.158	-.218
	Sig. (2-tailed)	.396	.239
I understand how to obtain the services/resources we need	Correlation Coefficient	-.069	-.333
	Sig. (2-tailed)	.713	.068
I understand how to obtain the information we need for our care/well-being	Correlation Coefficient	-.093	-.347
	Sig. (2-tailed)	.617	.056
I understand how to fill out the paperwork required by my providers	Correlation Coefficient	.140	-.187
	Sig. (2-tailed)	.452	.313
I understand how to navigate the insurance/Medicare/Medicaid	Correlation Coefficient	-.021	-.345
	Sig. (2-tailed)	.910	.057
I understand how to deal with my child's behaviors that are related to his/her MEB problems	Correlation Coefficient	-.421(*)	-.415(*)
	Sig. (2-tailed)	.016	.018
I understand how to juggle my child's appointments and activities	Correlation Coefficient	.040	-.250
	Sig. (2-tailed)	.829	.175
I understand how to fit our treatments into our life	Correlation Coefficient	.207	-.158
	Sig. (2-tailed)	.264	.395

		Years receiving services	Education
I understand how to administer medications to my child properly and appropriately	Correlation Coefficient	.137	-.129
	Sig. (2-tailed)	.453	.481
I am able to make decisions about our care from among differing recommendations and opinions from providers	Correlation Coefficient	-.124	-.050
	Sig. (2-tailed)	.500	.785
I am able to decide whether or not to agree with the diagnosis	Correlation Coefficient	-.201	-.166
	Sig. (2-tailed)	.269	.365
I am able to decide when I need to get a second opinion on our care	Correlation Coefficient	-.158	-.151
	Sig. (2-tailed)	.387	.411
I am able to balance the benefits and side effects of medications to determine whether or not my child should take them	Correlation Coefficient	-.332	-.284
	Sig. (2-tailed)	.068	.122
I am able to make placement decisions about my child (residential/school)	Correlation Coefficient	-.244	-.433(*)
	Sig. (2-tailed)	.178	.013
I am able to decide when I need to switch providers or see an additional provider	Correlation Coefficient	-.112	-.204
	Sig. (2-tailed)	.540	.264
I am able to decide whether or not the treatments/services provided have worked well enough or not	Correlation Coefficient	-.230	-.058
	Sig. (2-tailed)	.206	.753
I am able to decide between competing priorities for my time	Correlation Coefficient	-.109	-.100
	Sig. (2-tailed)	.554	.585
I am able to decide when my family needs help, assistance, or services	Correlation Coefficient	-.359(*)	-.384(*)
	Sig. (2-tailed)	.043	.030
I am able to know when my child/family needs to make changes in our lives	Correlation Coefficient	-.405(*)	-.391(*)
	Sig. (2-tailed)	.021	.027
I am able to decide when/to whom it is safe to disclose personal child and family information	Correlation Coefficient	-.114	-.327
	Sig. (2-tailed)	.533	.067

		Years receiving services	Education
I am capable of describing symptoms with our MEB service providers	Correlation Coefficient	.026	-.119
	Sig. (2-tailed)	.888	.517
I am capable of asking questions of our service providers	Correlation Coefficient	.037	-.165
	Sig. (2-tailed)	.842	.366
I am capable of expressing concerns to our service providers	Correlation Coefficient	-.064	.000
	Sig. (2-tailed)	.727	1.000
I am capable of disagreeing with our service providers	Correlation Coefficient	-.194	-.117
	Sig. (2-tailed)	.287	.524
I am capable of negotiating with our service providers to reach treatment or service solutions that are best for everyone	Correlation Coefficient	-.274	-.220
	Sig. (2-tailed)	.136	.233
I am capable of communicating with our service providers in all the systems we use (DJJ, DCF, etc.)	Correlation Coefficient	-.415(*)	-.296
	Sig. (2-tailed)	.018	.100
I am capable of asking for help, services, treatment, and resources in a way that gets us what we need	Correlation Coefficient	-.210	-.226
	Sig. (2-tailed)	.256	.222
I am a well-informed caregiver for my child	Correlation Coefficient	-.062	-.224
	Sig. (2-tailed)	.735	.218
Belief in Capabilities Score	Correlation Coefficient	-.397(*)	-.187
	Sig. (2-tailed)	.025	.306
Belief in Rights Score	Correlation Coefficient	-.010	.085
	Sig. (2-tailed)	.955	.643
Belief in Own Value Score	Correlation Coefficient	.241	-.050
	Sig. (2-tailed)	.191	.788
Functional Behavior Score	Correlation Coefficient	-.051	-.359(*)
	Sig. (2-tailed)	.784	.044

		Years receiving services	Education
Critical Behavior Score	Correlation Coefficient	-.335	-.366(*)
	Sig. (2-tailed)	.061	.039
Communication Behavior Score	Correlation Coefficient	-.214	-.355(*)
	Sig. (2-tailed)	.240	.046
Knowledge/Understanding Score	Correlation Coefficient	-.121	-.415(*)
	Sig. (2-tailed)	.510	.018
Factual Knowledge Score	Correlation Coefficient	-.316	-.007
	Sig. (2-tailed)	.102	.973

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

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

According to a Spearman's Rho at the 95% confidence level, there was a statistically significant negative relationship between the overall health literacy score and the education level of caregivers ($p = .009$). There was also a statistically significant negative relationship between education and the "Knowledge/Understanding" sub-domain ($p = .018$), the "Functional Behavior" sub-domain ($p = .022$), the "Critical Behavior" sub-domain ($p = .020$), and the "Communication Behavior" sub-domain ($p = .023$). In addition, there was a statistically significant negative relationship between education and 12 of the individual items:

- "My child, family, and I have many strengths that enhance our health and well-being" (Belief in Capabilities);
- "The mental, emotional, and/or behavioral problems in my child can be successfully treated" (Belief in Capabilities);
- "I have the right to ask my child's service providers questions about my child's care" (Belief in Rights);
- "I understand the role of the school in my child's well-being and development" (Knowledge/Understanding);

- "I have a good understanding of what my child/family need" (Knowledge/Understanding);
- "I understand how the DJJ system works" (Knowledge/Understanding);
- "I understand how the DCF system works" (Knowledge/Understanding);
- "I understand how to deal with my child's behaviors that are related to his/her mental, emotional, and/or behavioral problems" (Functional Behaviors);
- "I am able to make placement decisions (residential, school) about my child" (Critical Behaviors);
- "I am able to decide when my family needs help, assistance, or services" (Critical Behaviors);
- "I am able to know when my child/family needs to make changes in our lives" (Critical Behaviors); and
- "My child's problems might require treating our entire family—Agree" (Factual Knowledge).

Appendix C: Revisions to the Caregiver Instrument

Revised Scale

Scale Reduction: Since the desired instrument will be representative of the scales for each sub-domain, a revised scale was drafted utilizing those 4 items (or 5, in the case of ties) that contributed the most to the overall internal consistency of each sub-domain scale by looking at the effect of omitting each item would have on the overall alpha reliability estimate (see Table C1). This item selection was confirmed by looking at the factor loading scales of each sub-domain on Principal Components Factor Analysis.

Table C1
Scale Reduction

	Cronbach's Alpha if Item Deleted
BELIEF IN CAPABILITIES	
My child, family, and I have many strengths that enhance our health and well-being	.734
I am sure that my child will be able to support him/herself when he/she grows up	.724
I am capable of solving my or my family's problems	.689
I am capable of being a good parent to all my children	.702
I am capable of making any changes I need to make in order to help my child/family	.717
The mental, emotional, and/or behavioral problems in my child can be successfully treated	.704
I can control my child's behavior	.696
Treatment for my family is under my control	.716
Things can get better for my child and family	.729
I can survive the problems my child and family are going through	.726
BELIEF IN RIGHTS	
My child and family have the right to receive testing we need	.774
I have the right to ask for help when I need it	.777
I have the right to ask for all available services in the community that my child or family needs	.748
My child has the right to receive an education regardless of his/her problems or needs	.782
I have the right to ask my child's service providers questions about my child's care	.785
I have the right to choose my child's services	.773
I have the right to be heard by my child's service providers	.780

	Cronbach's Alpha if Item Deleted
I have the right to be treated with respect by my child's service providers	.782
I have the right to question the decisions of my child's service providers	.800
BELIEF IN OWN VALUE	
Having MEB problems does not make my child less valuable to society	.409
MEB in children can be illnesses (not discipline issues)	.470
The opinions of my child are important	.483
My opinions are important	.504
Having a mental illness does not make you abnormal	.454
FUNCTIONAL BEHAVIORS	
I know how to find treatment options for my child/family when necessary	.850
I understand how to make an appointment with my providers	.859
I understand how to obtain the services/resources we need	.840
I understand how to obtain the information we need for our care/well-being	.840
I understand how to fill out the paperwork required by my providers	.855
I understand how to navigate the insurance/Medicare/Medicaid	.856
I understand how to deal with my child's behaviors that are related to his/her MEB problems	.868
I understand how to juggle my child's appointments and activities	.853
I understand how to fit our treatments into our life	.850
I understand how to administer medications to my child properly and appropriately	.865
CRITICAL BEHAVIORS	
I am able to make decisions about our care from among differing recommendations and opinions from providers	.863
I am able to decide whether or not to agree with the diagnosis	.864
I am able to decide when I need to get a second opinion on our care	.861
I am able to balance the benefits and side effects of medications to determine whether or not my child should take them	.866
I am able to make placement decisions about my child (residential/school)	.866
I am able to decide when I need to switch providers or see an additional provider	.861
I am able to decide whether or not the treatments/services provided have worked well enough or not	.860

	Cronbach's Alpha if Item Deleted
I am able to decide between competing priorities for my time	.873
I am able to decide when my family needs help, assistance, or services	.862
I am able to know when my child/family needs to make changes in our lives	.861
I am able to decide when/to whom it is safe to disclose personal child and family information	.878
COMMUNICATION BEHAVIORS	
I am capable of describing symptoms with our MEB service providers	.813
I am capable of asking questions of our service providers	.788
I am capable of expressing concerns to our service providers	.794
I am capable of disagreeing with our service providers	.818
I am capable of negotiating with our service providers to reach treatment or service solutions that are best for everyone	.792
I am capable of communicating with our service providers in all the systems we use (DJJ, DCF, etc.)	.815
I am capable of asking for help, services, treatment, and resources in a way that gets us what we need	.788
KNOWLEDGE/UNDERSTANDING	
I understand all the terms my service providers use	.887
I understand any changes my providers want us to make	.885
I understand the differences between psychologists, psychiatrists, therapists, etc.	.887
There are options other than medications that are available to us	.898
I know what mental health resources and services are available to us	.886
I know how to access all the resources, services and treatments available in this community	.885
I understand the diagnosis given to us by our MH service providers	.887
I know what some of the risks are to the treatments recommended by our providers	.886
I know what some of the benefits are to the treatments recommended by our providers	.886
I understand the role of the school in my child's well-being and development	.889
I understand the school's IEP process	.897
I have a good understanding of what my child/family need	.893
I understand how the DJJ system works	.889
I understand how the DCF system works	.890
I can tell when my child's behavior is a result of MI and when it's a discipline problem	.895
I am a well-informed caregiver for my child	.890

The revised caregiver instrument would include the following 28 questions categorized in six sub-domains. Each item is rated on a 5-point Likert-scale ranging from Strongly Agree to Strongly Disagree.

Belief in Value and Capabilities:

1. I am capable of solving my or my family's problems.
2. I am capable of being a good parent to all my children.
3. The mental, emotional, and/or behavioral problems in my child can be successfully treated.
4. I can control my child's behavior.
5. Treatment for my family is under my control.

Belief in Rights:

6. My child and family have the right to receive testing we need.
7. I have the right to ask for help when I need it.
8. I have the right to ask for all available services in the community that my child or family needs.
9. I have the right to choose my child's services.

Knowledge/Understanding:

10. I understand any changes my providers want us to make.
11. I know what mental health resources and services are available to us.
12. I know how to access all the resources, services, and treatments available in this community.
13. I know what some of the risks are to the treatments recommended by our providers.
14. I know what some of the benefits are to the treatments recommended by our providers.

Functional Behaviors:

15. I know how to find treatment options for my child/family when necessary.
16. I understand how to obtain the services/resources we need.
17. I understand how to obtain the information we need for our care/well-being.

18. I understand how to juggle my child's appointments and activities.
19. I understand how to fit our treatments into our life.

Critical Behaviors:

20. I am able to decide when I need to get a second opinion on our care.
21. I am able to decide when I need to switch providers or see an additional provider.
22. I am able to decide whether or not the treatments/services provided have worked well enough or not.
23. I am able to decide when my family needs help, assistance, or services.
24. I am able to know when my child/family needs to make changes in our lives.

Communication Behaviors:

25. I am capable of asking questions of our service providers.
26. I am capable of expressing concerns to our service providers.
27. I am capable of negotiating with our service providers to reach treatment or service solutions that are best for everyone.
28. I am capable of asking for help, services, treatment, and resources in a way that gets us what we need.

Belief in Value and Capabilities: Because of the low alpha reliability estimate for the overall "Belief in Own Value" sub-domain scale and because this scale is conceptually similar to the "Belief in Capabilities" scale, these two sub-domains were combined. The combined sub-domain of "Belief in Value and Capabilities" had an overall alpha reliability estimate of .749, which is higher than the alpha reliability estimate for either of the two sub-domain scales individually. The five items in this combined scale that had the most negative effect on the overall alpha reliability estimate if deleted were "BC3: I am capable of solving my or my family's problems" (.720 alpha if deleted), "BC4: I am capable of being a good parent to all my children" (.721 alpha if deleted), "BC6:

The mental, emotional, and/or behavioral problems in my child can be successfully treated" (.725 alpha if deleted), "BC7: I can control my child's behavior" (.731 alpha if deleted), and "BC8: Treatment for my family is under my control" (.731 alpha if deleted). Initial factor analysis (principal component analysis) of the combined scale revealed five factors. A scree plot showed one conceptually sound factor (which accounted for 25% of the variance). All of these selected items had high factor loadings on the Principal Component Analysis.

Belief in Rights: The four items in this sub-scale that had the most negative effect on the overall alpha reliability estimate if deleted were "BR1: My child and family have the right to receive testing we need" (.774 alpha if deleted), "BR2: I have the right to ask for help when I need it" (.777 alpha if deleted), "BR3: I have the right to ask for all available services in the community that my child or family needs" (.748 alpha if deleted), and "BR6: I have the right to choose my child's services" (.773 alpha if deleted). Initial factor analysis (principal component analysis) of the sub-scale revealed three factors. A scree plot showed one conceptually sound factor (which accounted for 41% of the variance). All of these items had high factor loadings on the Principal Component Analysis.

Knowledge/Understanding: The five items in this sub-scale that had the most negative effect on the overall alpha reliability estimate if deleted were "KU2: I understand any changes my providers want us to make" (.885 alpha if deleted), "KU5: I know what mental health resources and services are available to us" (.886 alpha if deleted), "KU6: I know how to access all the resources, services, and treatments available in this community" (.885 alpha if deleted), "KU8: I know what some of the risks are to the treatments recommended by our providers" (.886 alpha if deleted), and "KU9: I know what some of the benefits are to the treatments recommended by our providers" (.886 alpha if deleted). Initial factor analysis (principal component analysis) of the sub-scale revealed five factors. A scree plot showed one conceptually sound factor (which accounted for 41% of the variance). All of these items had high factor loadings on the Principal Component Analysis.

Functional Behaviors: The five items in this sub-scale that had the most negative effect on the overall alpha reliability estimate if deleted were “FB1: I know how to find treatment options for my child/family when necessary” (.850 alpha if deleted), “FB3: I understand how to obtain the services/resources we need” (.840 alpha if deleted), “FB4: I understand how to obtain the information we need for our care/well-being” (.840 alpha if deleted), “FB8: I understand how to juggle my child’s appointments and activities” (.853 alpha if deleted) and “FB9: I understand how to fit our treatments into our life” (.850 alpha if deleted). Initial factor analysis (principal component analysis) of the sub-scale revealed three factors. A scree plot showed one conceptually sound factor (which accounted for 47% of the variance). These five items had the five highest factor loadings on the Principal Component Analysis.

Critical Behaviors: The five items in this sub-scale that had the most negative effect on the overall alpha reliability estimate if deleted were “CB3: I am able to decide when I need to get a second opinion on our care” (.861 alpha if deleted), “CB6: I am able to decide when I need to switch providers or see an additional provider” (.861 alpha if deleted), “CB7: I am able to decide whether or not the treatments/services provided have worked well enough or not” (.860 alpha if deleted), “CB9: I am able to decide when my family needs help, assistance, or services” (.862 alpha if deleted) and “CB10: I am able to know when my child/family needs to make changes in our lives” (.861 alpha if deleted). Initial factor analysis (principal component analysis) of the sub-scale revealed two factors. A scree plot showed one conceptually sound factor (which accounted for 47% of the variance). These five items had the five highest factor loadings on the Principal Component Analysis.

Communication Behaviors: The four items in this sub-scale that had the most negative effect on the overall alpha reliability estimate if deleted were “COMM2: I am capable of asking questions of our service providers” (.788 alpha if deleted), “COMM3: I am capable of expressing concerns to our service providers” (.794 alpha if deleted), “COMM5: I am capable of negotiating with our service providers to reach treatment or service solutions that are best for

everyone” (.792 alpha if deleted), and “COMM7: I am capable of asking for help, services, treatment, and resources in a way that gets us what we need” (.788 alpha if deleted). Initial factor analysis (principal component analysis) of the combined scale revealed one factor, and a scree plot showed one conceptually sound factor (which accounted for 53% of the variance). These four items had the four highest factor loadings on the Principal Component Analysis.

Reliability: All of the 28 items showed test-retest reliability from wave 1 to 2, in that none of the items showed a statistically significant difference between waves, according to a paired t-test, at the 95% confidence level.

Internal Consistency: The Cronbach’s Alpha reliability estimate on the revised total scale (28 items) is .917, indicating high internal consistency. Cronbach’s Alpha on each of the sub-domains is .714 for “Belief in Capabilities/Value,” .742 for “Belief in Rights,” .850 for “Knowledge/ Understanding,” .835 for “Functional Behaviors,” .816 for “Critical Behaviors,” and .797 for “Communication Behaviors,” all acceptable levels of internal consistency, according to DeVellis (2003) (See Table B2).

Predictive Validity: According to a Spearman’s Rho correlation, overall mental health literacy, as measured by this revised 28-item scale, had a statistically significant association with the Family Empowerment Scale at the 99% confidence level.

Construct Validity: According to a Spearman’s Rho correlation, overall mental health literacy, as measured by this revised 28-item scale, had a statistically significant negative association with the education level of the caregiver ($p = .046$), but not with the years of receiving services.

Appendix D: Results from Estimating Service Utilization Model

Auxiliary Regression: The first result from this part of the analysis is the ordinary least squares regression of the overall mental health literacy score among the group of caregiver respondents against the following covariates: education, gender, race/ethnicity, age, marital status, employment status, and health status. In this and the other results presented in this section, education was constructed (as was done last year) as a categorical variable with three possible values: 1 (“Less than High School:” did not attend or did not complete high school), 2 (“High School:” has a high school diploma, GED, or vocational training), and 3 (“College:” has completed at least some college-level work). Decadal categories were created for age. Table D1 shows the result of this regression against the revised, 28-item, overall mental health literacy score. Because there were significant disparities between the 105-observation caregiver survey sample and the 715-observation Medicaid sample, in terms of educational attainment and employment status, this model was estimated as a weighted regression, with the weights made consistent with the education and employment-status proportions of the Medicaid sample. Four observations were dropped from this sample due to missing values.

Table D1 shows that only education, age, and health status are significant determinants of overall mental health literacy. In particular, there is a decrease in mental health literacy as educational attainment increases. Because the coefficients on education show the incremental effect of each category, the results indicate that both high school and college-educated individuals are less literate than those with less than a high school education. While this result may seem counterintuitive, it is consistent with our previous test of construct validity, which found a statistically significant negative relationship between mental health literacy and education.

The other statistically significant results of this regression indicate that those who are younger (less than 40) tend to be more literate than the older members of the population, and that those with a low (fair or poor) level of self-reported health are generally less literate than individuals in relatively

Table D1
Mental Health Literacy OLS Regression (Selected Results)

Dependent Variable	Overall Literacy (28-Item Scale)		Factual Knowledge (10-Item True/False Scale)	
	Coef.	P value	Coef.	P value
Constant	4.332	0.000	5.321	0.000
Less than High School	—	—	—	—
High School	-0.374 ^a	0.032**	0.262	0.795
College	-0.112	0.340	1.11	0.068*
Female	0.306	0.191	0.077	0.937
White	—	—	—	—
Black	0.007	0.953	-1.747	0.002**
Other Race	0.049	0.772	-3.439	0.004**
Hispanic	-0.011	0.952	0.064	0.914
Age 20s	0.413	0.019**	-0.284	0.729
Age 30s	0.315	0.014**	-0.453	0.565
Age 40s	—	—	—	—
Age 50s	0.163	0.398	0.683	0.430
Age 60s	-0.158	0.387	0.974	0.267
Married	0.055	0.600	0.321	0.614
Currently Employed	-0.048	0.664	0.480	0.428
Low Self-Reported Health (Fair or Poor)	-0.222	0.055*	0.174	0.797
Number of Observations	101		101	
R2	0.244		0.281	

** Significant at the 5 percent, two-tail level

* Significant at the 10 percent, two-tail level

^a Parameter estimates for education should be interpreted as relative to the prior category.

good health. This latter result is consistent with that of Hsieh and Lin (1997).

To provide some perspective on these results, we estimated the same model using an alternative measure of mental health literacy. In the knowledge sub-domain, 10 supplementary true/false (Agree/Disagree/Not Sure) items were included that were intended to elicit an objective measure of the respondent’s knowledge of mental health and mental health care issues. This Factual Knowledge measure is similar to some previous approaches to measuring consumer health knowledge (Kenkel, 1990; Hsieh and Lin, 1997), so it was incorporated into the analysis as an additional means to validate the overall measure of mental health literacy. The Factual Knowledge

measure is based on the number of correct answers to these items given by each caregiver respondent. For each of the 10 items, the respondent obtained a score of +1 for a correct answer and 0 for either an incorrect answer or if the respondent was not sure. Thus, the numeric range for this measure is from 0 to +10. The second set of results in Table D1 show the covariates that are significantly associated with this alternative measure of mental health literacy.

Education is a significant determinant of the Factual Knowledge measure of mental health literacy, but in contrast to the overall measure of mental health literacy, the relationship is positive. In this case, statistical significance occurs with the highest category, “College,” which suggests that individuals who are more readily able to acquire knowledge in general are also able to acquire higher levels of mental health knowledge. In addition, non-White racial groups tend to have lower levels of mental health knowledge than White members of the population. The reason for this is not clear, although this factor may reflect cultural differences among racial groups regarding attitudes about, and thus exposure to, mental health care issues. Age and marital status are also significant determinants of this measure of mental health literacy. The higher level of knowledge among the most senior members of the population may reflect more experience with, or perhaps more opportunity for exposure to, mental health issues. Regarding marital status, this result is consistent with the economic notion of “scale economies,” in that having a partner reduces the cost of acquiring information for each individual. In general, these results are consistent with those of studies having used similar approaches to measuring consumer health knowledge (Kenkel 1990, Hsieh and Lin 1997). However, as Table D1 shows, there is very little consistency in the results between the Factual Knowledge and overall measure of mental health literacy.

Logistic Regression of Utilization: This and the next set of results look at the relationship between mental health literacy and utilization of non-acute (i.e., outpatient) behavioral health care services. As mentioned, this basic model was presented in the study last year, in which educational attainment was used as a proxy for mental health literacy. Thus, three

sets of results are presented for comparison:

- 1) the model using the new (revised) overall measure of mental health literacy,
- 2) the model using the alternative Factual Knowledge measure of mental literacy, and
- 3) the model as presented last year, using the categorical measure of educational attainment as a proxy for mental health literacy.

As described above, the overall and Factual Knowledge measures of mental health literacy for each observation, which is a PMHP Medicaid recipient from either Area 1 or 6, is constructed (or a projection) based on the estimated coefficients obtained from the auxiliary regression conducted on the caregiver-survey sample. To facilitate interpretation of the coefficient (or, in the case of the logistic regression, odds ratio) associated with mental health literacy in these utilization models, a dichotomous variable was created for mental health literacy (equal to 0 or 1) based on whether the value of the measure for each observation is below or above the median value of the entire sample.

The first part of this analysis is a logistic model estimating the probability that an eligible PMHP Medicaid recipient uses any non-acute behavioral health services during a 12-month period. Selected results are presented in Table D2 (complete results can be obtained by request from the lead author). In all three specifications of the model, results are mostly similar. In all cases, having had a prior acute visit for behavioral health services or receipt of supplemental security income (SSI) are statistically significant and strong positive predictors of utilizing non-acute services. Living in an urban county (living in a county having a metropolitan area of 1 million or more population) is also a strong predictor, but only statistically significant in the proxy model. In no case is the main measure (or proxy measure) of mental health literacy statistically significant. However, in the model using overall measure of mental health literacy, the interaction of literacy and living in an urban county is positive and significant. The estimated odds ratio indicates that the likelihood of any visit is over three times greater if an individual is highly literate and living in an urban area.

Table D2
Logistic Regression of the Probability of Making Any Non-Acute Visits (Selected Results)

Model: Dependent Variable:	Logistic Model using Overall Literacy Prob. non-acute visits>0		Logistic Model using Factual Knowledge Prob. non-acute visits>0		Logistic Model using Proxy Measures Prob. non-acute visits>0	
	Odds Ratio	P value	Odds Ratio	P value	Odds Ratio	P value
High Overall Literacy	0.867	0.746	N/A	N/A	N/A	N/A
High Factual Knowledge	N/A	N/A	1.184	0.742	N/A	N/A
Less than High School	—	—	—	—	—	—
High School	1.369 ^a	0.334	1.057	0.825	1.855	0.187
College	0.999	0.997	0.947	0.844	1.183	0.702
Any acute visits (Acute Visits > 0)	12.584	0.000**	12.586	0.000**	12.138	0.000**
Currently Receiving SSI	1.491	0.352	N/A	N/A	N/A	N/A
Urban County	1.428	0.622	1.309	0.732	16.475	0.027**
High Overall Literacy x SSI	1.491	0.352	N/A	N/A	N/A	N/A
High Overall Literacy x Urban	3.247	0.012**	N/A	N/A	N/A	N/A
High Factual Knowledge x SSI	N/A	N/A	0.814	0.638	N/A	N/A
High Factual Knowledge x Urban	N/A	N/A	1.815	0.220	N/A	N/A
High School x SSI	N/A	N/A	N/A	N/A	0.564	0.268
College x SSI	N/A	N/A	N/A	N/A	0.759	0.603
High School x Urban	N/A	N/A	N/A	N/A	0.544	0.259
College x Urban	N/A	N/A	N/A	N/A	0.903	0.870
Number of Observations	715		715		715	
Pseudo R2	0.173		0.166		0.168	

** Significant at the 5 percent, two-tail level

* Significant at the 10 percent, two-tail level

^a Parameter estimates for education should be interpreted as relative to the prior category.

Ordinary Least Squares Regression of Utilization: The second part of this analysis is an ordinary least squares model estimating the (log of) number of non-acute visits, conditional on the individual making any visits. Thus, the sample for this regression (155 observations) is a subset of the PMHP Medicaid sample containing only those individuals who made any visits for non-acute behavioral health services in a 12-month period. Selected results of this model are presented in Table D3 (again, complete results can be obtained upon request from the lead author).

These results, as with the logistics model, also show a fair amount of consistency across the three specifications of the model. In all three specifications, individuals who have been diagnosed with a severe mental illness will have more visits than individuals without a severe mental illness. Also, as

in the previous model, living in an urban county is positively associated with utilization, although only statistically significant in the proxy model.

Mental health literacy is statistically significant in two of three models: the model using overall literacy as well as in the the proxy model. As discovered in the study last year (which estimated only the proxy model), utilization initially increases in educational attainment but then decreases for those in the highest education category. As described in that study, this suggests some complementarity as well as substitutability between consumer and provider literacy, with substitutability becoming more apparent at higher levels of consumer literacy. In the model using the overall measure of mental health literacy (defined as a dichotomous variable separating those above and below the median value of mental health literacy in the sample), we see only

Table D3
OLS Regression of the Number of Non-Acute Visits (Selected Results)

Model: Dependent Variable:	OLS Model using Overall Literacy Log(Non-acute visits)		OLS Model using Factual Knowledge Log(Non-acute visits)		OLS Model using Proxy Measures Log(Non-acute visits)	
	Coef.	P value	Coef.	P value	Coef.	P value
Independent Variables:						
Constant	2.315	0.000**	2.033	0.001**	1.583	0.037**
High Overall Literacy	-1.054	0.045**	N/A	N/A	N/A	N/A
High Factual Knowledge	N/A	N/A	-0.283	0.625	N/A	N/A
Less than High School	—	—	—	—	—	—
High School	0.288 ^a	0.411	0.313	0.201	1.258	0.036**
College	-0.067	0.840	0.005	0.987	-1.564	0.002**
Currently Receivingg SSI	-0.274	0.451	0.329	0.305	0.424	0.332
Urban County	0.546	0.474	-0.234	0.740	1.741	0.053*
High Overall Literacy x SSI	1.027	0.038**	N/A	N/A	N/A	N/A
High Overall Literacy X Severe Mental Illness	0.148	0.820	N/A	N/A	N/A	N/A
High Overall Literacy x Urban	0.161	0.692	N/A	N/A	N/A	N/A
High Factual Knowledge x SSI	N/A	N/A	-0.308	0.487	N/A	N/A
High Fractal Knowledge x Severe Mental Illness	N/A	N/A	0.525	0.270	N/A	N/A
High Factual Knowledge x Urban	N/A	N/A	0.203	0.648	N/A	N/A
High School x SSI	N/A	N/A	N/A	N/A	-0.946	0.101
College x SSI	N/A	N/A	N/A	N/A	1.491	0.012**
High School x Severe Mental Illness	N/A	N/A	N/A	N/A	-0.325	0.457
College x Severe Mental Illness	N/A	N/A	N/A	N/A	0.615	0.274
High School x Urban	N/A	N/A	N/A	N/A	-0.474	0.464
College x Urban	N/A	N/A	N/A	N/A	0.873	0.208
Number of Observations	155		155		155	
R ²	0.424		0.411		0.439	

** Significant at the 5 percent, two-tail level

* Significant at the 10 percent, two-tail level

^a Parameter estimates for education should be interpreted as relative to the prior category.

substitutability between consumer and provider literacy as literacy increases. This substitutability is because the sign is negative on the coefficient for High Overall Literacy. Because the coefficient is in reference to a transformed (log) measure of the dependent variable, it cannot be directly interpreted. However, it indicates that between low and high literate groups (holding all other characteristics of consumers constant at their mean values) the average number of visits falls from 9 visits to 5 visits per year. This compares to a baseline average of 8 visits per year for the entire sample.

Another common result between the overall literacy and proxy model is the statistical significance of the interaction between College and Currently Receiving SSI (“College x SSI”), which indicates that any negative influence on utilization from being

highly literate is substantially diminished among recipients of supplemental security income (SSI). Indeed, in the model using the overall measure of mental health literacy, highly literate SSI recipients make, on average, 8 visits a year (the same as baseline).

Finally, it is interesting to note that in the specification of the models using the projected measures of mental health literacy (Overall Literacy and Factual Knowledge), neither education variable (High School or College) is statistically significant, seemingly as a result of there being a more direct measure of mental health literacy included in these models. This suggests that education serves as a good proxy for either of these measures of mental health literacy (Wooldridge, 2002, pp. 63-64).