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Differential Association of Stigma with Perceived Need and Mental Health Service Use

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Abstract

This study examined the role of stigma at two stages of the treatment-seeking process by assessing associations between various types of stigma and perceived need for mental health treatment as well as actual treatment utilization. We analyzed cross-sectional data from the 2014 and 2016 California Well-Being Survey, a phone survey with a representative sample of 1,954 California residents with probable mental illness. Multivariable logistic regression indicated that perceived need was associated with less negative beliefs about mental illness (OR=0.72; 95% CI= 0.54, 0.95) and greater intentions to conceal a mental illness (OR=1.47; 95% CI=1.12, 1.92). Among respondents with perceived need, treatment use was associated with greater mental health knowledge/advocacy (OR=1.63; 95% CI=1.03, 2.56) and less negative treatment attitudes (OR=0.66; 95% CI=0.43, 1.00). Understanding which aspects of stigma are related to different stages of the help-seeking process is essential to guiding policy and program initiatives aimed at ensuring individuals with mental illness obtain needed mental health services.

Keywords

Mental illness stigma; perceived need; mental health service use

Mental disorders are among the leading causes of disability in the United States (U. S. Burden of Disease Collaborators, 2013; World Health Organization, 2017). Despite the availability of effective treatments, more than half of individuals experiencing a mental illness go without needed mental health services (Walker et al, 2015). Although logistical barriers such as cost and limited access to treatment play a role, stigma has been implicated as a major factor in preventing individuals from acknowledging, disclosing, and getting help for mental health problems (Clement et al., 2015; National Academy of Sciences, 2016; Schnyder et al., 2017; US Department of Health Human Services, 2002). A number of mental health campaigns have been developed using a wide range of messages to target stigma in an effort to reduce barriers to treatment utilization (Gronholm et al, 2017; Rubio-Valera et al, 2016; Sampogna et al, 2017). A recent review concluded that these campaigns

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are effective but that there are wide variations across different efforts (Clement et al, 2013). Factors that have limited success may include the failure to adequately target messages and audiences, two key principles of effective campaign design (Noar, 2006).

Stigma is multidimensional (Link et al, 2004) and messages targeting specific aspects of stigma that are associated with the treatment seeking process could enhance the effectiveness of mental health campaigns. A recent meta-analysis examined the association between various dimensions of stigma and mental health service use (Schnyder et al, 2017). Categorizing the many previously studied aspects of stigma into four broad groups, the meta-analytic study found that *personal stigma* (e.g., personally-held negative attitudes towards people with mental illness) and *negative help-seeking attitudes* (e.g., embarrassment about obtaining mental health treatment) were significantly associated with a lower likelihood of obtaining mental health services. However, no significant associations were found for *perceived public stigma* (e.g., perceptions of negative societal treatment of people with mental illness) or *self-stigma* (e.g., negative attitudes towards mental illness among people with mental illness). Thus, interventions may need to target specific aspects of stigma most closely related to treatment seeking.

Another potential strategy for targeting stigma reduction efforts is to focus on specific stages of the help-seeking process. Stigma may play a different role in perception of need for treatment (Corrigan et al, 2014; US Department of Health Human Services, 2002), a critical early step in the help-seeking process (Mechanic, 2002; Mojtabai et al, 2002), than in seeking treatment once a need is perceived. Not perceiving a need for treatment is the most commonly cited reason for not initiating treatment among individuals with a mental illness (Andrade et al, 2014; Mojtabai et al, 2011). It is estimated that 6 in 10 individuals with a mental disorder do not perceive a need for treatment (Andrade et al, 2014). Fears of being stigmatized, feeling embarrassed about seeking treatment, and negative attitudes toward treatment may contribute to perceptions of not needing treatment (Mechanic, 2002; Mojtabai et al, 2002). While no studies of stigma and perceived need for treatment have been conducted in the general population, studies of university students have found evidence that personal stigma (Eisenberg et al, 2009), but not perceived public stigma (Golberstein et al, 2009), is associated with perceived need.

We are not aware of any studies that have examined the differential associations of various types of stigma with treatment use among people who have perceived a need for treatment. Prior studies have investigated the association between perceived need and either a single dimension of stigma such as personal stigma (Schomerus et al., 2012) or a general measure of stigma (Nadeem et al., 2009; Oexle et al., 2015), and have found that perceived need is negatively correlated with stigma. This study is the first to use a population based sample with mild to serious psychological distress – prime audiences for prevention interventions – to examine the potentially distinct associations that different aspects of stigma have with the two stages of help-seeking, perceiving need and seeking treatment after perceiving a need.

We do so using the California Well-Being Surveys (CWBS). In 2004, California voters passed the Mental Health Services Act, a law which funds (among other things) a statewide initiative to reduce mental illness stigma (Clark et al, 2013). A key focus is on prevention

and early intervention among individuals at risk for mental illness in order to foster greater recognition of mental health problems and use of mental health services. As part of this initiative, the CWBS was administered in 2014 and 2016 to monitor levels of mental illness stigma among a representative sample of California adults with probable mental illness. Drawing from the 2014 and 2016 CWBS, we examined: (1) associations between various types of stigma and perceived need for treatment and, (2) among respondents with perceived need, associations between types of stigma and mental health service use. Increased knowledge regarding which aspects of stigma are most strongly tied to these two stages of help-seeking may help to inform recent calls for the development of a national strategy to eradicate the stigma of mental illness in the United States (National Academy of Sciences, 2016), and other stigma-reduction campaigns taking place worldwide (Dunion et al, 2005; Henderson et al, 2009; Sartorius et al, 2005; Vaughan et al, 2004).

METHODS

Sample

Participants were 1,954 individuals who had taken part in either the 2014 or 2016 California Well-Being Surveys (CWBS), cross-sectional population surveillance surveys focused on mental illness stigma. To obtain a representative sample of California residents with probable mental illness, individuals who participated in the California Health Interview Survey (CHIS) were recruited to participate in the CWBS. The CHIS is a cross-sectional, random digit dial telephone (equal proportion land lines and cell phones) health survey that is administered on a continuous basis with a representative sample of California residents (Ponce et al, 2004). Respondents from the 2013 CHIS and the 2014 CHIS, who were 18 years or older, completed the CHIS in English or Spanish, consented to be re-contacted for future studies, and scored nine or greater on the Kessler-6 (K6) were eligible to participate in the 2014 and 2016 CWBS, respectively. K6 scores of eight to twelve have been used as a cut-off for mild to moderate distress and greater than twelve for severe distress (Kessler et al, 2003). A cut-off of 8 can be used for classifying individuals as having probable mild to moderate disorder – a designation for those who meet criteria according to the Diagnostic and Statistical Manual of Mental Disorder IV (American Psychiatric Association, 1994; Kessler et al, 2008). Mild to moderate disorders carry considerable burden and a high likelihood of transition to serious mental illness. This fits with our desire to study both those who have serious mental health problems as well as identify levers for early intervention. We employed a slightly stricter cut off, which may have resulted in the exclusion of a small number of individuals with mild to moderate disorder. The Westat Corporation conducted the survey data collection. Informed consent was obtained and study procedures were approved by the authors' institutional review board.

Procedures and Measures

Structured telephone interviews were conducted in English and Spanish between May and August 2014 (2014 CWBS) and between January 2016 and March 2016 (2016 CWBS). Demographic information such as age, gender, and race/ethnicity were assessed.

Perceived need was assessed with the following item, “Was there ever a time during the past 12 months when you felt that you might need to see a professional because of problems with your mental health, emotions, nerves, or your use of alcohol or drugs?” *Mental health service use* was assessed by asking respondents if they had seen a primary care physician, general practitioner, or other professional such as a counselor, psychiatrist, or social workers for problems with their mental or emotional health in the past 12 months. Response options for both dependent variables were yes (coded 1) or no (coded 0).

To measure *mental illness stigma*, the CWBS contains fourteen items mostly drawn from other population-based surveys employed to assess the impact of stigma-reduction campaigns. The CWBS stigma items were chosen to represent a wide variety of stigma types and their demonstrated sensitivity to change (Kobau et al, 2010; Mojtabai, 2007; See Change The National Mental Health Stigma Reduction Partnership, 2012; Wyllie et al, 2012). The CWBS used these items as individual outcomes.

Data Analysis

To provide a more parsimonious approach to the present analysis, we conducted an exploratory factor analysis on the fourteen stigma indicators to empirically derive a reduced set of predictors. Full information maximum likelihood was used to estimate the factor model treating the stigma indicators as continuous. This approach uses all available data in the presence of missing data without relying on imputation or case-wise deletion of observation. Eigenvalues, scree plots, goodness-of-fit indices, and proportion of variance explained were used to determine model fit (Tabachnick and Fidell, 2007). Factor scores were derived by using the regression implied by the factor model of the factor scores given the stigma items, which results in factor scores as weighted averages of the stigma items with weights related to the factor loadings. Using the derived factor scores, two sets of binary and multivariable logistic regressions were conducted. The first set examined associations between the stigma factors and perceived need for treatment among the entire sample. The second set examined associations between stigma factors and mental health service use among the subset of individuals who perceived a need for treatment. Multivariable models controlled for demographics as well as for other stigma factors.

Some respondents replied “It depends”, “I don’t know” or refused to answer an occasional question. Missing data on items ranged from 1.1% to 6.7% of responses. We ran a Full-Information Maximum Likelihood estimation, which utilizes all available responses in all observations of the dataset, and created factor scores based on this analysis for all observations. All analyses were weighted to account for the CHIS sample frame and differential nonresponse to the follow up surveys. Age, sex, race/ethnicity, home ownership, California region, educational attainment, and cellphone/landline indicator were associated with nonresponse. Weights incorporated a full sample weight plus 80 replicate weights. Factor scores were generated using R software. All other analyses for this paper were generated using SAS/STAT software, Version 9 of the SAS System for Linux.

RESULTS

A total of 2,395 respondents from the 2013 CHIS and 1,984 respondents from the 2014 CHIS were eligible to participate in the 2014 and 2016 CWBS, respectively. As seen in Figure 1, non-participation due to refusals, language problems, and no longer being eligible (e.g., deceased, moved out of area), resulted in a response rate of 45.2% and 46.4% for the 2014 and 2016 CWBS, respectively. Approximately a third of the sample were young adults aged 18 to 29 years (31.3%), 60.6% were female, 39.8% were White, 43.1% Hispanic/Latino, 7.0% Asian-American, 4.9% African American, and 5.3% other ethnicity.

Exploratory factor analysis (EFA) of the mental illness stigma indicators resulted in a six-factor solution. Five eigenvalues exceeded one; a sixth had a value of 0.98 (a seventh explained little additional variance). Compared to the five-factor solution, the six-factor solution had better model fit (RMSEA=0.03, $p<.05$; GFI=0.9995, $p<.0004$; CFI=0.992, $p<.05$) and resulted in distinct factors, five driven by two or three items and the sixth by a single item (i.e., perceived public stigma). No items showed strong cross-factor loadings. We labeled the factors: negative beliefs about mental illness, recovery beliefs, negative treatment attitudes, concealment intentions, perceived public stigma and mental health knowledge/advocacy (See Table 1). Factors accounted for 44.7% of the variance.

In this sample of adults with mild to severe psychological distress, 51.9% perceived a need for mental health treatment. At the binary level, two stigma constructs were significantly associated with perceived need for treatment (see Table 2). Respondents with more negative beliefs about mental illness were less likely to believe they needed treatment in the prior year (Odds Ratios (OR) = 0.62; 95% Confidence Interval (CI) = 0.50, 0.77). Respondents who were more likely to conceal a mental health problem from others had higher levels of perceived need (OR=1.50; 95% CI = 1.18, 1.91). When accounting for all the demographic and stigma measures simultaneously, a multivariable logistic regression analysis revealed that negative beliefs (OR = 0.72; 95% CI = 0.54, 0.95) and concealment intentions (OR = 1.47; 95% CI = 1.12, 1.92) remained significant predictors of perceived need for treatment.

Among those who perceived a need for treatment, significant binary associations were observed for three of the six stigma factors (see Table 3). Mental health service use was associated with greater mental health knowledge (OR=1.73; 95%CI = 1.21, 2.47) and lower levels of negative beliefs about mental illness (OR=0.60; 95%CI = 0.41, 0.88) and negative treatment attitudes (OR=0.65; 95%CI = 0.48, 0.86). At the multivariable level, only mental health knowledge (OR=1.63; 95%CI= 1.03,2.56) and negative treatment attitudes (OR=0.66; 95%CI = 0.43, 1.00) maintained significant associations with mental health service use. Greater mental health knowledge was related to an increased likelihood of having received treatment and treatment stigma was associated with a decreased likelihood of mental health service utilization.

DISCUSSION

Failure to study those needing or using treatment has been identified as an important factor limiting our understanding of how to intervene to reduce mental illness stigma, as is failure

to differentiate targeted groups (Thornicroft et al, 2016). Among a representative sample of adults with probable mild to serious mental illness, we find that two stages of the help-seeking process, perceiving a need for treatment and treatment use among those with perceived need are related to different facets of stigma. To lay the groundwork for our analyses, we conducted an exploratory factor analysis on the fourteen stigma items included in the CWBS that have been employed in other population-based surveillance and stigma campaign studies. To our knowledge, this is the first study to empirically derive a set of stigma dimensions in a representative sample of distressed individuals. The result was consistent with stigma types that have been examined previously in the literature with some slight variations (Clement et al., 2015; Schnyder et al., 2017). Prior studies have largely employed general measures of stigma or specific dimensions of stigma determined a priori (Wei et al., 2015). Other studies that have empirically derived stigma dimensions have relied on general population samples (Kobau et al., 2010) or clinical samples that were already engaged in mental health services (King et al., 2007; Corrigan et al., 2010).

Two factors, negative beliefs about mental illness and recovery beliefs, tap into two aspects of a more general construct others have labelled personal stigma. Our negative beliefs factor tapped into personally-held views of people with mental illness as devalued members of society (Link et al, 2004; Schnyder et al, 2017), whereas the recovery beliefs factor encapsulated personal views about the recovery and outcomes of people with mental illness. Others have also found these aspects of personal stigma to be empirically distinct (Kobau et al, 2010).

Two other factors, negative treatment attitudes and concealment intention, both relate to the previously described stigma domain of help-seeking attitudes (Schnyder et al, 2017). Our perceived public stigma factor directly corresponds to the domain “public stigma,” – the degree to which people with mental illness experience high levels of prejudice and discrimination (Golberstein et al, 2008; Golberstein et al, 2009). The remaining factor, mental health knowledge/advocacy, combines two constructs that have been previously discussed in the literature. Lack of knowledge has been conceptualized as an aspect of stigma that can inhibit help seeking (Pescosolido, 2013; Thornicroft et al, 2007) – it has not been as widely studied with respect to its association with treatment use compared to other stigma domains (Clement et al, 2015). Advocacy appears to tap into affirming and empowering attitudes toward people with mental illness, and to “protest” which have been identified as important targets for mental illness stigma reduction programs (Corrigan et al, 2014; Corrigan et al, 2015; Corrigan et al, 199). It is interesting that these constructs shared a single factor in our sample, suggesting that knowledge and empowerment are closely aligned.

Among these derived stigma factors, we found that negative beliefs about mental illness and concealment intentions were significantly associated with perceived need for treatment. Specifically, individuals were more likely to perceive a need for treatment if they harbored less negative beliefs about mental illness and greater intentions to conceal a mental health problem. The association between negative beliefs and perceived need is consistent with two previous studies, which found negative associations between personally-held stigmatizing beliefs about people with mental illness and a person’s perception of their own need for

treatment. (Eisenberg et al, 2009; Schomerus et al, 2012). Neither of the prior studies was representative of those with psychological distress – one examined a large convenience sample of college students, the other a convenience sample of 25 individuals responding to ads describing symptoms of depression. Thus, our confirmation of their findings is a significant step forward in understanding the association between negative beliefs about mental illness and the likelihood of perceiving a need for treatment among individuals at risk for mental health problems.

The positive association of concealment intentions with perceived need observed in our study was unexpected. One possible explanation for this finding is that intentions to conceal a mental illness may be indicative of anticipated discrimination from one's social network (Isaksson et al, 2017). This may spur individuals to acknowledge symptoms and their need for treatment in the hopes of resolving their mental health challenges before they become noticeable to others.

Perceiving a need for treatment is a critical stage in the help-seeking process and has been described as the “rate limiting step” to accessing mental health services (Edlund et al, 2006). Though lack of perceived need for treatment is one of the most highly endorsed barriers to care (Mojtabai et al, 2011), little attention has been paid to how stigma may affect perceptions of need (Clement et al, 2015). Prior studies on perceived need have mainly focused on sociodemographic and clinical correlates (Breslau et al, 2017; Edlund et al, 2006; Mechanic, 2002; Mojtabai et al, 2002), but our findings indicate that stigma, in particular negative beliefs about mental illness and concealment intentions, may play an important role.

Once individuals acknowledge a need for treatment, we found that treatment attitudes and mental health knowledge/advocacy are significantly correlated with mental health service utilization. Our findings are consistent with two prior reviews that have indicated that treatment-related attitudes are important contributors to mental health service utilization (Clement et al, 2015; Schnyder et al, 2017). These reviews did not distinguish those with a perceived need for treatment from others. Thus, our results extend their conclusion by suggesting that treatment attitudes are important during a later stage of the treatment-seeking process, after individuals have acknowledged a need for that treatment, and may not influence those who have not yet reached this stage.

“Problems of knowledge” or ignorance of mental illness has been conceptualized as one aspect of stigma that can interfere with the help-seeking process (Evans-Lacko et al, 2010; Thornicroft et al, 2007). In a longitudinal study involving a population-based sample with elevated levels of psychological distress, greater knowledge about depression predicted subsequent receipt of mental health treatment even when controlling for symptoms and prior service use (Bonabi et al, 2016). Deficits in mental health knowledge have been documented at the population level, which has served as an impetus for the dissemination of mental health literacy interventions (Jorm, 2012). Although mental health literacy interventions have been shown to improve mental health knowledge and treatment attitudes, effects on actual treatment use have yielded more mixed findings (Wong et al, 2015). To our knowledge, ours is the first study to assess the influence of types of stigma on mental health

treatment use that includes mental health knowledge. Further research is warranted on the effects of interventions that target both mental health literacy and stigma on improving utilization of needed mental health treatment.

Perceived public stigma and beliefs about recovery do not appear to be related to either perceived need or actual treatment use. This is in line with other studies which have called into question whether certain types of stigma such as perceived public stigma are as significant a barrier to mental health treatment as previously assumed (Eisenberg et al, 2009; Golberstein et al, 2008; Schnyder et al, 2017).

Findings should be considered in light of certain study limitations. This study is based on a cross-sectional population survey, precluding our ability to establish causal relationships between stigma and perceived need and mental health service utilization. Future research using a prospective design is needed to extend this study's findings. This study also relied on a concise set of measures that have been used effectively for population surveillance of stigma. It is possible that the set of stigma measures may not have accounted for as much of the variance in our outcomes variables as would other previously validated measures of the constructs that emerged from our factor analysis. For instance, the perceived public stigma factor consisted of a single item, which may have missed important dimensions captured by other measures. In addition, further study is warranted of the effects of other types of stigma not included in our study such as self-stigma (i.e., feeling ashamed about one's mental illness) and experienced stigma (i.e., discrimination), which may influence perceptions of treatment need and mental health service utilization as well as retention in treatment (Clement et al, 2015). Moreover, our study did not assess for the influence of other factors unrelated to mental illness stigma such as socioeconomic status that could affect perceived need and treatment use. This study may be limited in its generalizability. This study was limited to a population sample of California residents and levels of stigma have been shown to vary across regions within the United States (MMWR, 2010) and across high-income countries (Pescosolido et al., 2013). Finally, this study had somewhat low response rates, which is not necessarily indicative of bias but is associated with an increased likelihood of non-respondents being different from respondents, which was corrected for with response weights (Davern, 2013; Groves, 2006). Further, this study's use of random digit dial sampling may have missed certain groups such as those in institutionalized residences (e.g., psychiatric hospitals, prisons). Nonetheless, a key strength is our study of a large representative sample of persons who are the key target of efforts to increase early treatment for mental health problems – individuals experiencing mental distress but who may or may not have labeled this as indicating a mental health problem or a need for treatment, many of whom had not yet sought treatment.

CONCLUSION

Our results suggest that initiatives attempting to increase treatment seeking through the reduction of stigma must carefully consider their target population's stage in the treatment seeking process, as well as the specific type of stigma that should be addressed at that stage. For those who recognize a need for treatment, enhancing perceptions of treatment effectiveness and increasing mental health knowledge and empowerment may be especially

important targets (Corrigan et al, 2014). For those with unrecognized need, reducing personal negative beliefs about mental illness should be considered. But two of the most often pursued goals in mental health initiatives, addressing perceived public stigma and beliefs about recovery (New Freedom Commission on Mental Health, 2003; United States Department of Health and Human Services, 2005), may not figure as prominently in the treatment seeking process as has been previously conceived. Additional research is needed to confirm the pattern of findings in longitudinal studies.

Our findings are consistent with worldwide efforts to reduce the stigma of mental illness as a method of increasing treatment seeking (National Academy of Sciences, 2016). At the same time, they highlight the importance of accounting for the likely differential influence of various facets of stigma at the different stages of the help-seeking process (i.e. perceived need versus treatment use). Programs targeting those who may not recognize their illness and need for treatment should address personally held stigmatizing beliefs, while those aimed at audiences likely to have acknowledged their needs should focus on increasing mental health knowledge and positive treatment attitudes. This is essential in improving the effectiveness of programs and policies in the U.S. and abroad (Clark et al, 2013; Henderson et al, 2013) that are aimed at ensuring that individuals experiencing mental illness obtain the care that they need.

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FIGURE 1. 2014 and 2016 California Wellbeing Survey (CWBS) AAPOR Response and Cooperation Rates

Note. CHIS = California Health Interview Survey; e = estimated proportion eligible

^aAAPOR Response Rate 4 = completes/completes+eligible, non-response+ e (unknown eligibility, non-response), where $e = 0.985$.

^bAAPOR Response Rate 4 = Completes+partials/completes+partials +eligible, non-response + e (unknown eligibility, non-response), where $e = 0.964$.

TABLE 1

Factor Loadings for Mental Illness Stigma Survey Items (N=1,924)

Items	Factor 1 Negative Beliefs	Factor 2 Recovery Beliefs	Factor 3 Negative Treatment Attitudes	Factor 4 Conceal-ment Intentions	Factor 5 Perceived Public Stigma	Factor 6 Mental Health Knowledge/Advocacy
A person with mental illness is a danger to others ^a	0.532	-0.055	0.071	-0.036	-0.025	-0.037
People who have had a mental illness are never going to be able to contribute much to society ^a	0.768	-0.234	-0.008	-0.067	0.041	-0.026
A person with mental illness can eventually recover ^a	-0.094	0.505	-0.014	-0.038	0.015	0.043
Treatment can help people with mental illness lead normal lives ^a	-0.089	0.559	-0.152	0.053	0.014	0.111
Would go for professional help for a serious emotional problem ^b	0.031	0.185	-0.301	-0.069	0.008	0.161
Would put off seeking treatment for fear of letting others know about your mental health problem ^b	0.078	-0.092	0.709	0.187	0.000	-0.031
Would delay seeking treatment for fear of being told that you have a serious mental health problem ^b	0.100	0.008	0.700	0.190	0.007	-0.047
Would try to hide your mental health problem from family or friends ^b	-0.011	0.025	0.284	0.831	0.026	-0.057
Would try to hide your mental health problem from co-workers or classmates ^b	-0.158	-0.028	0.185	0.655	0.035	-0.077
I know how I could be supportive of people	-0.041	0.091	-0.080	-0.062	-0.035	0.654

Items	Factor 1 Negative Beliefs	Factor 2 Recovery Beliefs	Factor 3 Negative Treatment Attitudes	Factor 4 Conceal-ment Intentions	Factor 5 Perceived Public Stigma	Factor 6 Mental Health Knowledge/Advocacy
with mental illness if I wanted to be ^a						
I can recognize the signs that someone may be dealing with a mental health problem or crisis ^a	-0.010	-0.042	-0.128	-0.001	0.049	0.532
I plan to take action to prevent discrimination against people with mental illness ^a	0.028	0.214	0.050	-0.066	0.089	0.454
People with mental illness experience high levels of prejudice and discrimination ^a	-0.014	0.082	0.033	0.028	0.983	0.158
People are generally caring and sympathetic to people with mental illness ^a	0.235	0.113	0.088	-0.128	-0.191	0.128

^aResponse options ranged from 1=strongly disagree to 5=strongly agree.

^bResponse options ranged from 1=definitely not to 4=definitely.

TABLE 2

Odds Ratios for Logistic Regression Predicting Perceived Need for Mental Health Treatment (N= 1,924)

Variable	Binary Estimate		Multivariable Estimate	
	OR	95% CI	OR	95% CI
Perceived public stigma	0.88	(0.73, 1.06)	0.96	(0.79, 1.16)
Concealment intentions	1.50 **	(1.18, 1.91)	1.47 **	(1.12, 1.92)
Negative beliefs about mental illness	0.62 ***	(0.50, 0.77)	0.72 **	(0.54, 0.95)
Mental health knowledge/advocacy	1.22	(0.98, 1.51)	1.19	(0.97, 1.46)
Negative treatment attitudes	1.05	(0.86, 1.28)	1.01	(0.81, 1.27)
Recovery beliefs	1.15	(0.89, 1.48)	1.00	(0.75, 1.34)
Female	1.50 **	(1.03, 2.19)	1.53	(0.97, 2.41)
Young adults (ages 18 to 29) ^a	1.34	(0.91, 1.99)	1.10	(0.72, 1.69)
Latino English-survey ^b	1.05	(0.71, 1.54)	0.71	(0.46, 1.08)
Latino Spanish-survey ^b	0.43 **	(0.24, 0.77)	0.55	(0.23, 1.29)
African American ^b	1.35	(0.62, 2.91)	0.96	(0.43, 2.18)
Asian American ^b	0.43	(0.18, 1.02)	0.37 **	(0.14, 0.98)
Other Race/Ethnicity ^b	0.85	(0.43, 1.7)	0.65	(0.30, 1.43)

Note. OR=odds ratios; CI=confidence interval.

^aReference group is respondents ages 30 and older.

^bReference group is White respondents.

*
p<.05;

**
p<.01;

p<.001.

TABLE 3

Odds Ratios for Logistic Regression Predicting Mental Health Service Use Among Respondents with Perceived Need (N = 1,011)

Variable	Binary Estimate		Multivariable Estimate	
	OR	95% CI	OR	95% CI
Perceived public stigma	0.80	(0.60, 1.06)	0.84	(0.61, 1.15)
Concealment intentions	1.12	(0.81, 1.54)	1.14	(0.81, 1.60)
Negative beliefs about mental illness	0.60**	(0.41, 0.88)	0.89	(0.56, 1.41)
Mental health knowledge/advocacy	1.73**	(1.21, 2.47)	1.63**	(1.03, 2.56)
Negative treatment attitudes	0.65**	(0.48, 0.86)	0.66**	(0.43, 1.00) ^c
Recovery beliefs	1.39	(0.93, 2.07)	1.33	(0.71, 2.49)
Female	2.41***	(1.44, 4.04)	2.42**	(1.25, 4.66)
Young adults (ages 18 to 29) ^a	0.64	(0.35, 1.16)	0.46**	(0.25, 0.88)
Latino English-survey ^b	1.37	(0.74, 2.56)	1.31	(0.66, 2.63)
Latino Spanish-survey ^b	0.24**	(0.09, 0.63)	0.22**	(0.06, 0.81)
African American ^b	1.48	(0.35, 6.32)	0.86	(0.19, 3.85)
Asian American ^b	0.52	(0.13, 2.00)	0.88	(0.15, 5.17)
Other Race/Ethnicity ^b	0.74	(0.26, 2.08)	0.84	(0.32, 2.19)

Note. OR=odds ratios; CI=confidence interval.

^aReference group is respondents ages 30 and older.

^bReference group is White respondents.

^cThis estimate is significant even though the upper limit of the CI is equal 1. This is due to SAS' determination of significance based on estimates to the fourth decimal place, whereas the confidence limits are based on the odds ratio estimates to the third decimal place.

* p<.05;

** p<.01;

*** p<.001.