

Sociodemographic, perceived and objective need indicators of mental health treatment use and treatment-seeking intentions among primary care medical patients

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Abstract

We explored sociodemographic and illness/need associations with both recent mental healthcare utilization intensity and self-reported behavioral intentions to seek treatment. Data were examined from a community sample of 201 participants presenting for medical appointments at a Midwestern U.S. primary care clinic, in a cross-sectional survey study. Using non-linear regression analyses accounting for the excess of zero values in treatment visit counts, we found that both sociodemographic and illness/need models were significantly predictive of both recent treatment utilization intensity and intentions to seek treatment. Need models added substantial variance in prediction, above and beyond sociodemographic models. Variables with the greatest predictive role in explaining past treatment utilization intensity were greater depression severity, perceived need for treatment, older age, and lower income. Robust variables in predicting intentions to seek treatment were greater depression severity, perceived need for treatment, and more positive treatment attitudes. This study extends research findings on mental health treatment utilization, specifically addressing medical patients and using statistical methods appropriate to examining treatment visit counts, and demonstrates the importance of both objective and subjective illness/need variables in predicting recent service use intensity and intended future utilization.

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1. Introduction

Numerous studies have empirically demonstrated personal characteristics significantly correlated with mental healthcare utilization in the general population. However, few of these studies have examined this issue in samples of primary care medical patients, and have neglected to examine comprehensive and theoretically-driven predictor models of treatment use intensity (i.e., visit counts). Exploring mental healthcare use associations in primary care patients is important, since mental healthcare is most often sought and preferred by patients in primary care settings (Del Piccolo et al., 1998; Wang et al., 2006), while for others primary care serves as a gateway to specialty mental healthcare. Yet many primary care patients in need of treatment fail to obtain it because of a perceived stigma and other personal barriers to treatment. The present study addresses prediction of mental healthcare use intensity by examining demographic, attitudinal and need-based predictors in primary care patients.

The largest information base available about mental healthcare use correlates comes from results of several national community surveys examining relations with the use vs. non-use of treatment (but not treatment intensity). These studies have demonstrated positive relationships between mental healthcare use and such sociodemographic factors as female gender (Sorenson and Siegel, 1992; Kessler et al., 2005; Wang et al., 2005), younger age (Kessler et al., 1998; Lewis et al., 2005; Wang et al., 2005), and white race (Sorenson and Siegel, 1992; Kessler et al., 2005; Lewis et al., 2005; Wang et al., 2005). Access-related factors associated with treatment use have included higher household income (Wang et al., 2005), and living in an urban area (Kessler et al., 2005; Wang et al., 2005). Furthermore, variables relating to one's illness or need for treatment are connected with treatment utilization, such as mood disorders (Parslow and Jorm, 2000; Lewis et al., 2005) and to a lesser extent, mental health disability and perceptions of treatment need (Katz et al., 1997; Elhai and Ford, 2007).

A small handful of studies have sampled primary care patients to analyze mental healthcare use associations. Examining this issue in primary care settings is becoming increasingly important in contemporary times, since people feel comfortable and often prefer discussing mental health problems with their primary care medical providers (Del Piccolo et al., 1998). In fact, primary care is the fastest growing sector of mental health service provision in the healthcare industry (Wang et al., 2006). Primary care studies have demonstrated significant relationships between mental health treatment use and sociodemographic variables including female gender (Simon et al., 1994;

Elhai et al., 2006), middle age (Simon et al., 1994), sexual and physical assault (Walker et al., 1999) and traumatic event frequency (Elhai et al., 2006), and favorable attitudes toward treatment (Elhai et al., 2006). Probable posttraumatic stress disorder (PTSD) diagnoses (Elhai et al., 2006), an illness/need variable, was correlated with mental health treatment utilization as well. However, these few primary care patient investigations did not use the more comprehensive predictor models examined in national survey studies to estimate relationships with mental healthcare utilization. Thus we do not have a full nor comprehensive picture of the variables most related to treatment utilization among the primary care patient population.

The present study builds upon this literature on mental healthcare use associations in medical settings by: 1) examining a comprehensive model of predictor variables; 2) exploring treatment use intensity rather than a crude treatment “use/non-use” variable; and 3) additionally examining associations with self-reported intentions to seek treatment in the near future.

We organized our analyses using Andersen's behavioral model of healthcare use, a widely supported conceptual model explaining determinants of healthcare utilization (Andersen, 1995), with substantial relevance to understanding mental healthcare use (Bruce et al., 2002). The model theorizes that three factors influence healthcare use: 1) *predisposing* or historical/sociodemographic characteristics, such as gender, age and race, as well as attitudinal variables (e.g., toward treatment or one's illness); 2) *enabling* or access-related resources, such as income or health insurance; and 3) *need* for treatment or illness-related factors and perceptions. Thus this model can elucidate why people use treatment, and whether access to services is equitable—based on need rather than predisposing or enabling variables.

After controlling for predisposing and enabling characteristics, we expected that need variables would be the most important determinants of mental healthcare use intensity, supported in recent research among the general population (Bland et al., 1997; Elhai and Ford, 2007; Elhai et al., 2008b). More specifically, although subjectively perceived treatment need has been strongly correlated with treatment use (Edlund et al., 2006), it demonstrates weaker effects than objective need does (Katz et al., 1997; Elhai and Ford, 2007), which we hypothesized would be the driving need factor behind treatment use. Additionally, given the impressive body of research demonstrating that the intention to perform a behavior is substantially related to the actual future behavior (reviewed in Glasman and Albarracin, 2006), we expected parallel findings in predicting intentions to seek treatment.

This study is somewhat unique in the mental health services utilization literature in that we analyzed the treatment utilization outcome variable dimensionally, and in an appropriate statistical manner. Thus, in contrast to previous similar research, we were able to avoid placing patients who had used only one visit into the same category as those who used many visits. This is important because variables from past research shown to predict treatment use/non-use may be different from those predictive of the intensity of treatment use. For example, some cultures may typically avoid using mental healthcare, but in the relatively few members of the culture who have a serious treatment need, they may receive a high intensity of services. This study is important in clarifying factors that drive mental healthcare use intensity in medical patients, and can elucidate possible disparities in treatment access based on sociodemographic characteristics.

2. Methods

2.1. Participants

The present cross-sectional study was conducted in May of 2006, with institutional review board approval and informed consent obtained from every participant. Patients ($n=234$) invited to participate were community members (age 18 or older) presenting for appointments at a primary care clinic affiliated with a state university medical school in the Midwestern United States. Research assistants invited participation on a wide variety of days by consecutively inviting one patient after the other to participate, recruiting them in the clinic's waiting room, offering \$10 compensation. Patients were informed that the study queried "patients' opinions and experiences with mental health status and treatment use." Of 234 invited individuals, 201 agreed to participate (86% response rate).

Among the sample of 201 primary care patients, we report demographic characteristics only for the 187 used in statistical analyses, due to missing data described below. The sample comprised 135 women and 52 men, and age ranged from 18 to 90 years ($M=48.73$, $S.D.=17.93$, $mode=33$). Education ranged from 9 to 24 years ($M=13.84$, $S.D.=2.39$). Annual household income was less \$25,000 for 34.2% ($n=64$), \$25,000 to less than \$35,000 for 16.6% ($n=31$), \$35,000 to less than \$50,000 for 16.6% ($n=31$), \$50,000 to less than \$80,000 for 22.5% ($n=42$), and \$80,000 or higher for 10.2% ($n=19$), paralleling local 2000 Census data. Most worked full-time ($n=93$, 49.7%) or were unemployed/retired ($n=70$, 37.4%), while a minority worked part-

time ($n=24$, 12.8%). Most participants were white ($n=167$, 89.3%), with only three (1.6%) black individuals, two (1.1%) Asian Americans and 16 (8.6%) American Indians/Alaskan Natives. Regarding ethnicity, only three patients (1.6%) endorsed being Hispanic. Relationship status was predominantly married ($n=110$, 58.8%), while 24.6% ($n=46$) reported being single/cohabitating, and 16.6% ($n=31$) reported being divorced/separated/widowed. Most ($n=167$, 89.3%) had some form of health insurance coverage.

2.2. Instruments

2.2.1. Demographics

A demographics survey queried gender, age, educational level, employment and relationship status, annual income, race and ethnicity.

2.2.2. Attitudes Toward Seeking Professional Psychological Help

The Attitudes Toward Seeking Professional Psychological Help Scale-Short Form (ATSPPH, Fischer and Farina, 1995) is a 10-item self-report survey, using a four-point Likert scale, tapping current attitudes toward seeking mental health treatment. Internal consistency ranges from 0.77 to 0.84 among medical patients and young college students, respectively (Fischer and Farina, 1995; Elhai et al., 2008c), with an alpha of 0.79 in the present sample. One-month test-retest reliability was 0.80 (Fischer and Farina, 1995). Validity is adequate, with higher scores among mental healthcare users (Fischer and Farina, 1995; Elhai et al., 2008c). A total score is generated, with higher scores indicating more favorable treatment attitudes.

2.2.3. Mental health service utilization

The National Comorbidity Survey's (NCS) Health and Service Utilization Assessment interview queries previous mental health service use across several health providers and clinics (Kessler et al., 1999). This measure was adapted into a self-report survey (Elhai et al., 2006), querying lifetime and recent (6-month) utilization time frames. Participants were asked whether they ever sought mental health services from the listed providers (e.g., "psychologist," "general practitioner"), and for visit frequencies in the past 6 months. We calculated 6-month treatment use intensity by summing visit counts across providers (because of low cell sizes for individual provider counts, discussed below).

2.2.4. Behavioral intentions to seek treatment

In order to assess behavioral intentions to seek mental health treatment, participants were asked whether

they intended to visit a professional for any mental health-related problems in the next six months (adapted from Halgin et al., 1987). Participants were instructed to respond on a seven-point Likert scale, with answers ranging from 1 (“highly unlikely”) to 7 (“highly likely”).

2.2.5. Depression

The Center for Epidemiological Studies-Depression Scale (CES-D, Radloff, 1977) is a 20-item self-report instrument of depression severity. It anchors symptoms to the past week (albeit, not the past two-weeks required for a *DSM-IV* major depressive episode diagnosis). It is Likert-scaled, using four points. A cut-off score of 16 indicates a positive screen for depression. Excellent internal consistency (0.84 to 0.90), but poor to moderate test–retest reliability (0.51 for 2-weeks; 0.67 for 4 weeks) have been demonstrated (Radloff, 1977). Internal consistency of 0.88 was found by Knight et al. (1997), and 0.91 in the present sample. Adequate construct validity is reported, finding moderate correlations with the Hamilton and Raskin rating scales for depression (0.44 to 0.54) at admission, and higher after 4 weeks of treatment (0.69 to 0.75) (Radloff, 1977). A total score is generated, with higher scores suggesting greater depression severity.

2.2.6. Functional impairment

The Health Survey Short Form-12 (SF-12, Ware et al., 1996) measures physical and mental health impairments in functioning. Scores are calculated for physical health (PCS) and mental health (MCS) component scales, with lower scores indicating worse functioning. Test–retest reliability of 0.86 to 0.89 has been reported for PCS, and 0.76 to 0.77 for MCS, over a 2-week period (Ware et al., 1996). Internal consistencies of 0.85 for PCS and 0.80 for MCS were found in the present sample. PCS scores have been associated with a number of health criteria, including diabetes, health symptoms, and reported changes in general and physical health. MCS scores are associated with anxiety and mood disorders (Gill et al., 2007), and reported changes in mental health, including depression (Ware et al., 1996). PCS and MCS scores discriminated individuals with minor versus serious relevant health conditions (Ware et al., 1996).

2.2.7. Perceived need

Perceived need for treatment was assessed using a single item adapted from the NCS and used in Katz et al. (1997). Participants were asked: “Was there ever a time when your family or you, yourself, believed that you should see a doctor or professional about mental health problems?” In the general population, a significant rela-

tionship was found between this type of item and both *whether* individuals recently used mental health treatment (Katz et al., 1997), and the *intensity* of treatment use (Elhai and Ford, 2007).

2.3. Analysis

Of 201 subjects, missing data were found to be missing due to completely random reasons, Little’s MCAR $\chi^2(692)=723.22, P>0.05$ (i.e., study variables were not significantly associated with presence of missing values on these variables). Fourteen participants’ data were excluded from subsequent analyses for failing to respond to the CES-D or categorical predictor variables, resulting in $n=187$. Of the remaining sample, 11 participants were missing 1–2 items, which were then estimated using maximum likelihood estimation methods (Schafer and Graham, 2002) with SPSS’ Missing Value Analysis 14 software.

We assessed demographic and need associations with both recent mental healthcare use intensity (visit counts) and behavioral intentions to seek treatment in the near future. We used a predisposing/enabling predictor model supported in previous research (discussed above), including, gender, age, relationship status, attitudes towards treatment, income and employment status. In addition, we tested the incremental contribution of an empirically-supported need predictor model, including perceived need for treatment, and objective need indices including depression severity, and mental and physical health functional impairment. Outcome variables included: 1) recent 6-month mental healthcare use intensity (summed across provider visit counts); and 2) intentions to seek treatment in the next six months.

We used ordinary least-squares regression for examining the prediction of behavioral intentions to seek treatment, employing SPSS 14.0 software. Because of the overwhelming prevalence of “zero” values in 6-month service use intensity, we used zero-inflated negative binomial (ZINB) regression, analyzing data with the Stata 9.0 SE software. ZINB is a count data regression model using maximum likelihood estimation, and is specifically designed for modeling low base-rate dependent variables (Long, 1997; Hall and Zhengang, 2004). It models two latent groups, including “always zero” and “not always zero” groups (somewhat similar to, but more sophisticated than logistic regression), and weighs cases based on group status to examine the intensity of non-zero values. ZINB regression outperforms other regression methods in modeling mental health visit counts (including two-part models examining use/non-use separately from use intensity) (Bao, 2002; Elhai et al., 2008a).

In our data, ZINB regression was empirically found to be more appropriate than similar count regression models based on tests of overdispersion and zero value prevalence (Long, 1997), compared to zero-inflated Poisson regression, LR $\chi^2(1)=676.81$, $P<0.001$, and standard negative binomial regression, Vuong Test for non-nested models $z=4.32$, $P<0.001$. Thus these statistically significant findings suggested that ZINB could not be rejected in favor of other models (for a review of these models and a decision tree for their use, see Elhai et al., 2008a).

We tested for multicollinearity among the predictor variables, which could violate regression's assumptions. However, these variables were not substantially collinear, with only three inter-correlations greater than 0.4, including the CES-D with MCS ($r=-0.58$), CES-D with perceived need ($r=0.42$), and income with marital status ($r=0.50$).

3. Results

Among the effective sample of 187 primary care patients, 116 (62.0%) denied using any mental health treatment in the past six months. Among the 71 participants (38.0%) endorsing such mental health treatment use, the most commonly visited professionals included a general practitioner/family physician ($n=39$, 54.9%), other physician ($n=18$, 25.4%), counselor ($n=19$, 26.8%), psychologist ($n=15$, 21.1%), and psychiatrist ($n=14$, 19.7%) (with such low cell sizes for individual provider variables, summing visit counts across providers was essential in avoiding problems with maximum likelihood model convergence in the analyses). Fifty-two recent service users (73.2%) reported one to five visits, while eight (11.3%) reported six to 10 visits, and 11 (15.5%) claimed using more than 10 visits. Perceived treatment need was endorsed by 55 (77.5%) recent treatment users, compared to 30 (22.5%) non-users.

Participants' scores on the behavioral intentions scale ranged from 1 to 7 ($M=2.37$, S.D.=1.93), and ATSPPH scores ranged from 5 to 30 ($M=20.45$, S.D.=5.51). CES-D scores ranged from 0 to 51 ($M=13.356$, S.D.=10.89). Finally, SF-12 scores ranged from 15.98 to 57.93 ($M=44.49$, S.D.=6.79), and PCS scores ranged from 21.88 to 54.68 ($M=44.19$, S.D.=6.56).

3.1. Previous mental health service use intensity

The predisposing/enabling model accounted for a significant amount of variance in mental health visit counts, $\chi^2(6, n=187)=28.83$, $p<0.001$ (Nagelkerke's

$R^2=0.22$), demonstrating attitudes toward treatment ($z=2.69$) and lower income ($z=-2.38$) as statistically significant ($P<0.05$). The need model explained a substantial amount of additional variance, $\chi^2_{\text{change}}(4, n=187)=14.43$, $P<0.001$ (Nagelkerke's $R^2_{\text{change}}=0.21$). The strongest (and statistically significant) variables useful in predicting visit counts in the final model included older age ($z=3.00$), lower income ($z=-2.73$), identifying a perceived treatment need ($z=4.18$), and higher CES-D scores ($z=2.38$) (see Table 1).

While we hypothesized that need variables would be most related to visit counts, older age and lower income (predisposing/enabling variables) were significantly related to visits in the final model. To clarify this issue, we computed bivariate correlational analyses to assess whether these statistically significant predisposing and enabling variables were associated with the need variables, which could in turn explain their significant relationships with mental health visit counts. Younger age was related to both perceived treatment need ($r=-0.28$, $P<0.001$) and CES-D scores ($r=-0.23$, $P=0.001$). Income was associated with CES-D scores in the expected direction ($r=-0.17$, $P<0.05$), but not with perceived treatment need ($\phi=0.03$, $P>0.05$). Thus, the relationship between older age and greater mental health service use occurs despite the fact that younger age was associated with higher levels of objective and subjective need. By contrast, the relationship between low income and mental health service utilization intensity may be partially

Table 1
Final zero-inflated negative binomial regression model, predicting six-month mental health service use intensity among medical patients

Predictor variables	B	SE of B	z	exp(B)
Gender	0.10	0.41	0.24	1.11
Age	0.04	0.01	3.00**	1.04
Marital status	0.21	0.41	0.50	1.23
Employment status	-0.43	0.40	-1.07	0.65
ATSPPH	0.03	0.04	0.91	1.03
Income	-1.23	0.45	-2.73**	0.29
Perceived need	1.66	0.40	4.18***	5.26
CES-D	0.48	0.02	2.38*	1.62
MCS	0.01	0.03	0.51	1.01
PCS	-0.02	0.03	-0.54	0.98

Note. Gender: 1 = male, 2 = female; Marital Status: 0 = unmarried, 1 = married; Employment Status: 0 = unemployed, 1 = employed; Income (based on a median split): 0 = <\$35,000, 1 = \$35,000+; Perceived Need: 0 = No need, 1 = Need; exp(B) = rate ratio, or the percent change in visit counts associated with a one-unit increase in the predictor variable; ATSPPH = Attitudes Toward Seeking Professional Psychological Help Scale-Short Form; CES-D = Center for Epidemiological Studies-Depression Scale; MCS = SF-12 Mental Component score; PCS = SF-12 Physical Component score. * $P<0.05$, ** $P<0.01$, *** $P<0.001$.

explained by low income's relationship with objective (but not subjective) need. (It should be noted that we are unaware of statistical methods for testing mediation in this case when using negative binomial regression coefficients.)

Finally, it is important to note that the ZINB analysis failed to reveal any significant predictors of use vs. non-use of treatment. However a simple logistic regression analysis found that more positive treatment attitudes, lower income and having a perceived treatment need were significantly related to treatment use/non-use ($P < 0.05$). These service use/non-use results differ from the use intensity results presented above, most notably in that the use intensity findings demonstrated an objective need variable as statistically significant; however, no objective need variables emerged whether using logistic regression or ZINB's use/non-use component.

3.2. Behavioral intentions to seek mental healthcare

Next, we assessed our predictor models' associations with behavioral intentions to seek treatment in the next 6 months. Using linear regression, we found that the predisposing/enabling model accounted for a moderate amount of variance in treatment intentions, $F(6, 180) = 4.71$, $P < 0.001$ ($R^2 = 0.14$; adjusted $R^2 = 0.11$), with younger age ($\beta = -0.23$), and positive treatment attitudes ($\beta = 0.33$) statistically significant ($P < 0.05$). The need model explained a significant amount of additional variance, $F_{\text{change}}(4, 176) = 22.87$,

$P < 0.001$ ($R^2_{\text{change}} = 0.30$; adjusted $R^2_{\text{change}} = 0.29$). In the final model, four variables were predictive of intentions to seek treatment (and statistically significant, at $P < 0.05$): higher CES-D scores ($\beta = 0.44$), more positive treatment attitudes ($\beta = 0.26$), having a perceived need for treatment ($\beta = 0.22$), and, to a lesser extent, poorer physical health ($\beta = -0.15$) (See Table 2).

3.3. Previous mental health service use intensity and behavioral intentions

Finally, given the large amount of variance in behavioral intentions accounted for by the need model (controlling for the predisposing/enabling model), we attempted to clarify if this relationship would hold after additionally controlling for previous mental healthcare use. Thus we re-computed the linear regression analysis as above, but specifying the predisposing/enabling variables as the first model, followed by mental healthcare use intensity as the second model, and then the need variables as the third model. After implementing the predisposing/need model as above, mental healthcare use intensity added only 6% additional variance ($P < 0.001$), for a cumulative R^2 of 0.20. The need model explained an additional 24% variance ($P < 0.001$), culminating in a total of 44% variance accounted for in behavioral intentions. Interestingly, mental health visit counts, while a significant predictor in the second model ($\beta = 0.26$, $P < 0.001$), was no longer significant in the final model when accounting for the need variables (despite a significant individual bivariate zero-order correlation between service use intensity and behavioral intentions, $r = 0.29$, $P < 0.001$). Further, this final model's regression coefficients were almost identical to that found in the previous linear regression analysis.

Table 2

Ordinary least-squares regression, predicting behavioral intentions to seek mental health treatment in the next six months

Predictor variables	<i>B</i>	SE of <i>B</i>	β	<i>t</i>
Gender	-0.23	0.26	-0.05	-0.88
Age	-0.01	0.01	-0.10	-1.48
Marital status	0.28	0.27	0.07	1.03
Employment status	-0.14	0.26	-0.04	-0.54
ATSPPH	0.09	0.02	0.26	4.39***
Income	-0.01	0.27	0.00	-0.04
Perceived need	0.86	0.26	0.22	3.34**
CES-D	0.08	0.01	0.44	5.54***
MCS	0.02	0.02	0.08	1.07
PCS	-0.04	0.02	-0.15	-2.22*

Note. Gender: 1 = male, 2 = female; Marital Status: 0 = unmarried, 1 = married; Employment Status: 0 = unemployed, 1 = employed; Income (based on a median split): 0 = <\$35,000, 1 = \$35,000+; Perceived Need: 0 = No need, 1 = Need; ATSPPH = Attitudes Toward Seeking Professional Psychological Help Scale-Short Form; CES-D = Center for Epidemiological Studies-Depression Scale; MCS = SF-12 Mental Component score; PCS = SF-12 Physical Component score.

* $P < 0.05$, ** $P < 0.01$, *** $P < 0.001$.

4. Discussion

We found that both predisposing/enabling and need predictor models were associated with recent mental healthcare use intensity and intentions to seek treatment, using the behavioral model of healthcare use as a framework to guide our analyses. However, need was more robust than the predisposing/enabling model in predicting outcomes, confirming our hypotheses and supporting previous research (Bland et al., 1997; Elhai and Ford, 2007; Elhai et al., 2008b). These data suggest, reassuringly, that need variables such as depression and perception of need are the most robust predictors of mental healthcare use intensity, and that in current times there is comparatively less evidence of unfair socio-demographic disparities in mental healthcare use among primary care patients, supporting recent findings from

the general population (Elhai and Ford, 2007). However, it should be noted that our test of sociodemographic associations with treatment use could not feasibly include racial background as a sociodemographic variable, because of little evidenced racial background variability in this sample.

Interestingly, some differences emerged in the prediction of treatment use intensity vs. treatment intentions. For example, the predisposing/enabling model accounted for somewhat more variance in treatment use intensity (22%) than in treatment intentions (14%) (albeit, with different types of R^2 values assessed across these analyses). Additionally, the statistically significant variables in predicting treatment use intensity included need and predisposing variables (age and income), whereas significant variables in predicting treatment intentions consisted only of attitudinal and need variables. Thus in predicting treatment intentions, need seems to be especially more predictive than predisposing/enabling variables are.

Though it has been rarely studied, we found that having a perceived need for treatment was the most robust predictor of mental healthcare use intensity. In fact, perceived need was a more robust predictor than the more objective need indicators were, such as quantitative scores of depression and mental health functioning. This finding is in contrast to those of Katz et al. (1997) and Elhai and Ford (2007), who found that perceived need was less related to treatment utilization than objective need variables were. Of course, those studies sampled the general population rather than medical patients, and used structured diagnostic variables rather than the standardized self-report surveys used in the present study. Furthermore and perhaps even more importantly, they used only dichotomous (“presence/absence”) objective need variables, which may account for the discrepancy in results across these studies. Nonetheless, the present study’s results indicate that one’s own subjective perception of mental health need, albeit without formal psychological testing, is moderately predictive of actual and intended mental healthcare use. These findings suggest that it is not enough for a person to be depressed, for example, in order to receive treatment; rather the individual must additionally perceive a need for treatment of the condition. Future research should focus on assisting individuals with mental health problems to recognize that they have a need for treatment, in the hope that they ultimately use treatment services.

Despite the robust association between perceived need and treatment use intensity, the CES-D and ATSPPH were more robust than perceived need in predicting treat-

ment use *intentions*. Thus, actual need related to mental health problems (and physical health problems, which also emerged as a predictor in the multivariate analysis), as well as positive treatment attitudes, appear to be as important as the subjective perception of need in predicting intentions to seek mental health services. Treatment use intention has been studied in previous research, but has not been examined in the context of Andersen’s (1995) behavioral model. Given the substantial relationship between attitudes/intentions and behavior (reviewed in Glasman and Albarracin, 2006), examining intentions to seek treatment and treatment attitudes may ultimately prove to be promising future research in understanding and explaining treatment use patterns and models. But interestingly, we found that although previous mental healthcare use was moderately associated with behavioral intentions for treatment, the relationship disappeared after accounting for need variables. However, current attitudes toward treatment remained associated with intentions after controlling for need. Thus, it appears from this study that current attitudes toward treatment, and especially treatment need, are more important than one’s history of treatment use in explaining future intentions to seek treatment.

Other findings worth mentioning include associations between both older age and lower income with mental healthcare use intensity. Older age has not received support for predicting such treatment use (e.g., Klap et al., 2003), and our discrepant results possibly are due to the nature of patients presenting for primary care, a typically older population of individuals than those studied in national surveys. A study of another adult primary care patient sample (Ford et al., 2004) found that high utilizers of *medical* services were *younger* (M age=54) and more likely to have an anxiety or depressive disorder diagnosis than moderate/low utilizers (M age=69), although that study did not assess outpatient mental health service use. A similar pattern of findings has also been found for veterans seen in primary care clinics (Frueh et al., 2007). In light of the contrasting findings between these studies, and the well-replicated finding that medical services often are sought as a source of help with mental health problems (Del Piccolo et al., 1998; Wang et al., 2006), studies are needed that simultaneously assess both medical and mental health service utilization in primary care samples across age groups.

Furthermore, income has produced mixed findings in associations with treatment use intensity, but some studies do find support for a link between lower income and treatment use (Leaf et al., 1988). Income is considered a potential enabling factor in the behavioral model of healthcare utilization (Andersen, 1995),

because higher income provides more resources for purchasing health insurance and healthcare, as well as being associated with a greater likelihood of having employment-derived health insurance and access to healthcare providers. However, consistent with the present study's findings, lower income also may be associated with poorer mental health and therefore with greater need for and use of mental health services.

There were several limitations to this study. First, since participants were primary care patients, and because primary care physicians are commonly sought for mental health treatment (Del Piccolo et al., 1998), the sample might be more representative of those patients possessing easy access to mental healthcare. Second, participants may over-represent frequent (rather than occasional) clinic users, since we only sampled participants consecutively in the clinic's waiting room (rather than randomly recruiting patients enrolled in the clinic). Third, since the sample was examined in a Midwestern clinic, results may not be generalizable to clinics that have a more diverse population of patients. Fourth, we must acknowledge that our analyses incorporated current estimates of need as predictors of recent mental healthcare use; thus we were unable to examine the prospective prediction of future service use based on current need. Additionally, our perceived need variable reflected whether the respondent believed that either s/he or their family perceived that the individual had a need for treatment, and thus we did not separate individual from family perceptions of need. Furthermore, more precise measures of enabling resources or restrictions, such as details about health insurance benefits and institutional-related barriers to healthcare access (e.g., lack of evening clinic hours), were unavailable. And our measure of treatment intentions confounded intent and need for treatment, since those intending to seek treatment in the subsequent six months would need to foresee a need for such treatment. Finally, our models of objective treatment need were limited by the fact that they included responses to self-report surveys of depression and functional impairment; we did not assess primary care patients with structured diagnostic interview-based measures of mental disorders (e.g., Boardman et al., 2004) and cannot infer from results that a depression diagnosis would be related to our outcome variables.

Nonetheless, this study contributes to and provides important insights into the individual characteristics related to mental healthcare use and treatment use intentions. It clarifies that perhaps both subjective and objective need drive the use of mental health services, over and above sociodemographic characteristics. Finally, the results provide some evidence that perhaps socio-

demographic characteristics may not play a severe role in preventing access to treatment, as need appeared much more related to treatment use intensity than such socio-demographic factors.

Further research with medical patients is needed to better understand the individual characteristics associated with mental healthcare utilization. Using statistical methods such as ZINB regression would be useful to further study service use in an appropriate manner, and would likely result in less Type I error in mistakenly identifying trivial predictors of treatment use (Elhai et al., 2008a). Further, examining the prediction of behavioral intentions to seek treatment in the context of Andersen's (1995) model can represent a potentially valuable means of intervention by educating medical patients about the value of seeking treatment.

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