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Associations of Perceived Discrimination With Impaired Functioning in a Population Sample With Psychological Distress

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Abstract

Objective—To test associations between perceived discrimination based on mental health status and impaired functioning in a population sample with psychological distress.

Methods—Interviews were conducted with a sample of respondents to the California Health Interview Survey with mild, moderate, or severe psychological distress. Perceived discrimination was assessed using 14 items covering four domains in which discrimination is reported: social, partner, institutional, and work. Associations of perceived discrimination scores (total score and domain scores) with impaired functioning, measured by the likelihood and number of days out of role, were estimated with statistical adjustment for demographic characteristics and serious psychological distress.

Results—Discrimination domain scores are significantly correlated (r ranging from .34 to .65). Total discrimination score is associated with having days out of role (OR = 1.20, 95% CI = 1.10–1.30) and with number of days out of role (5.5 days) after adjustment for demographics and psychological distress. The high correlation among the domain scores makes the attribution of association to particular domains uncertain. Removal of the effect of discrimination using model-based simulation reduces past-year days out of role by 39.4 (SE 11.3) days.

Conclusions—This observational study supports the suggestion that discrimination against people with mental illness contributes to their impaired functioning in a diverse range of social

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roles. The results provide preliminary evidence that reduction in discrimination against people with mental illness could improve social functioning and work productivity. Correlations among domain scores make it difficult to draw conclusions about domain-specific associations.

Impaired functioning, or the inability to work or carry out usual activities, is a major cause of disability for individuals with mental disorders (Alonso et al., 2004). A large cross-national study that assessed functional impairment as days out of role (i.e., the number of days an individual was unable to carry out his or her normal activities due to illness) found that mental disorders account for 11.9 days out of role on average, comprising 16.5% of all days out of role due to health conditions (Alonso et al., 2011). While improved access to treatment is often recommended as a public health strategy to improve functioning, broader based efforts to change public attitudes toward people with mental illness may also have a positive impact (Mehta et al., 2015; Thornicroft et al., 2016). In particular, programs that target stigma against individuals with mental illness aim to reduce the discrimination that occurs in multiple settings, including workplaces, housing markets, familial relationships, and health care settings (Corker et al., 2013; Mangili, Ponteri, Buizza, & Rossi, 2011; Stuart, 2016; Thornicroft, Rose, & Kassam, 2007). By decreasing discrimination, these programs aim to remove a barrier to role performance by people with mental disorders. Understanding the relationship between discrimination and impaired functioning is thus important for gauging the potential personal and societal impact that stigma-reduction campaigns might achieve.

Although public health efforts to reduce stigma are based in part on the impact of discrimination on functioning, empirical evidence regarding this relationship is scarce. There is empirical evidence that discrimination has an adverse impact on work productivity, as measured by earnings. A study of a U.S. national sample conducted in the mid-1990s found that people with mental illness who reported experiences of workplace discrimination had lower earnings than people with mental illness who did not report discrimination (Baldwin & Marcus, 2006). While that study focused specifically on discrimination in the workplace, other studies find that people with mental illness experience discrimination not only at work but across a wide range of settings (Corker et al., 2013; Hamilton et al., 2016). To our knowledge, no studies have examined the relationship of perceived discrimination related to mental health status across the multiple domains in which it occurs with functional impairment more broadly.

In this study, we examine associations between perceived discrimination and impaired functioning, measured as days out of role, in a representative sample of individuals in the state of California with a probable mental health problem. Because psychological distress may be related to both perception of discrimination and days out of role, we adjust for a measure of clinically significant psychological distress. If, as hypothesized, discrimination contributes to impaired functioning related to mental illness, we would expect to find positive associations between perceived discrimination and days out of role. In addition, we examine whether discrimination experiences in distinct domains, such as housing, family, and employment, have distinct impacts on days out of role. By examining these relationships in observational data, this study takes an important step toward assessing the potential

impact that reducing stigma could have on the level of disability associated with mental illness.

METHODS

Sample Description

Data come from the California Well-Being Survey (CWBS), a population survey of Californians with mild to serious psychological distress. The CWBS sample was drawn from respondents to the 2013 and 2015 California Health Interview Survey (CHIS), a random-digit dial survey of California residents age 18 and older. CHIS respondents were eligible for the CWBS follow-up interview if they were willing to be recontacted, responded to the CHIS in English or Spanish, and had a mild, moderate, or serious level of psychological distress, as indicated by a score of 9 or higher on the K6 measure of psychological distress (Kessler et al., 2003). CWBS interviews were conducted by phone in English or Spanish in 2014 with respondents drawn from the 2013 CHIS, and in 2015–2016 with respondents drawn from the 2015 CHIS. Response rates were 45.2% in 2014 and 46.4% in 2015. The CWBS adjusted for nonresponse using a sample-based raking approach that mitigates undercoverage and nonresponse, with the CWBS weighted to match the sample totals from the CHIS with respect to age, gender, race/ethnicity, household tenure (own/rent), region, educational attainment, and a cell phone or landline indicator. Data from both samples are combined in this article. Informed consent for participation in the initial interview and for recontact for follow up was obtained from respondents at the time of the initial interview. Research procedures were approved by the RAND Human Subjects Protection Committee.

The sample used in this study is restricted to CWBS respondents with perceived need for mental health treatment in the past year ($N = 748$). 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?”

Measures

Serious psychological distress was measured by the K6, a short screening scale designed to maximize differentiation at clinically significant levels of distress (Kessler et al., 2002; Kessler et al., 2003). K6 scores in the range of 8 to 12 indicate mild to moderate mental illness, while scores of 13 or higher indicate serious mental illness. Scores were assessed for the highest level of distress experienced during the past 12 months. The K6 was administered as part of the CHIS interview and used to select the CWBS sample, which included respondents scoring 8 or higher. The K6 was readministered in the CWBS interview. The score from the CWBS interview was used to adjust models for psychological distress contemporaneous with the other measurements.

Perceived discrimination due to mental health status in the past 12 months was assessed in 14 Likert items with four response options (*Often*, *Sometimes*, *Rarely*, or *Never*; see Table 1 for the items). The items were adapted by the research team to assess perceived

discrimination related to mental health status through a review of existing instruments, such as the Discrimination and Stigma Scale (Brohan et al., 2013) and the Everyday Discrimination Scale (Williams, Yan, Jackson, & Anderson, 1997). Responses to each item were dichotomized to reflect any perceived discrimination versus none. Discrimination items were combined into four domain scores based on whether the discrimination was perceived in (1) work or hiring (three items; theoretical range 0 to 3), (2) social relationships (five items, theoretical range 0 to 5), (3) other institutional relationships (five items, theoretical range 0 to 5) or (4) romantic partner relationships (one item, theoretical range 0 to 1). A total perceived discrimination score was created by summing across all 14 items (theoretical range 0 to 14).

Impaired functioning was assessed using a modified question from the World Mental Health version of the Composite International Diagnostic Interview (Kessler & Ustun, 2004). The question asks the number of days in the past year during which the respondent was “totally unable to work or carry out your normal activities because of your feeling nervous, depressed, or emotionally stressed.”

Statistical Analysis

We used a series of regression models to analyze the association between perceived discrimination and the number of days out of role using two sets of models: one predicting the probability of any days out of role (using logistic regression) and another predicting the number of days out of role among people with at least one day out of role (using ordinary least squares [OLS] regression). For each outcome, we test separate bivariate associations for each discrimination domain and the total score. We then estimated three adjusted models for these associations, adjusting for demographics, demographics and psychological distress, and demographics, psychological distress, and all of the other domains. This sequence of models allows us to observe some of the factors that may be driving associations and any impact of collinearity on results.

The use of separate models for the likelihood and number of days out of role makes conclusions regarding the magnitude of associations difficult to understand directly from the model outputs. Thus, we also use a recycled prediction (also known as “predicted marginals”) approach to estimate the expected number of disability days attributable to perceived discrimination (Gaubard & Korn, 1999). In this approach the statistical model is used to estimate the expected number of days out of role under counterfactual conditions by assigning alternative values to covariates for discrimination scores. Days out of role under the actual distribution of discrimination are then compared with the expected days out of role under the hypothetical case of no discrimination. This is achieved by multiplying, at the individual level, the probability of any disability by the expected number of disability days given any disability (with discrimination as observed or set to zero), and then averaging across the study population. Standard errors are estimated using the bootstrap method.

RESULTS

About two-thirds of the sample is over age 30 and about two-thirds are female (Table 1), reflecting common patterns of perceived need for mental health treatment in the general

population (Mojtabai, Olfson, & Mechanic, 2002). Slightly over half of the sample is White. About one-third of the sample is Hispanic. The sample has a high level of psychological distress, as expected due to the design, with almost two-thirds scoring over the K6 threshold of 13, indicating likely serious mental illness. In addition, 80% of the sample report having days out of role due to mental health problems in the past year. The average number of days out of role in the past year is 86.4 in the entire sample and 109.9 among those reporting at least one day out of role (not shown in table).

Means and standard deviations for the 14 discrimination items, the four discrimination domain scales, and the total discrimination scale are shown in Table 2. The individual discrimination items have means that range from a high of .66 (family, not including spouse or partner) to a low of .20 (trying to find or keep housing). Items in the social domain are the most commonly endorsed, with three of the five items exceeding 50% endorsement. In contrast, of the five items in the institutional domain, none exceed 33% endorsement. On average, 5.33 items were endorsed from the set of 14.

Perceived discrimination is highly correlated across domains (Table 3). Perceived discrimination in the work, social, and institutional domains have correlations among them that range from 0.59 to 0.65. Correlations of those three domain scores with perceived discrimination by partners are somewhat lower, but still high, ranging from 0.34 to 0.35. Correlations with the partner domain are likely to be relatively small due to the limited range of the partner domain which is assessed by a single item. Correlations of the domain scores with the total discrimination score, formed by summing all the items, are very high for the three composite scores, ranging from .84 to .87, and for the partner discrimination item, .50.

In a simple cross-tabulation, the discrimination domains are significantly associated with days out of role (Table 4), but these associations emerge only at higher levels of disability. Respondents reporting between one and eight days out of role do not report higher levels of discrimination than respondents reporting no days out of role. However, those with nine or more days out of role report significantly higher levels of discrimination, relative to those with no days out of role, in all four domains. Similarly, compared to the no days out of role group, psychological distress is not elevated in the group reporting one to eight days out of role but is elevated in the group reporting nine or more days out of role.

Table 5 presents the results of our bivariate and multivariate regression modeling of relationships of the perceived discrimination domain scales with the measure of days out of role. The association is shown in two parts, because of the skewed distribution of responses regarding days out of role. The first part (5A) shows associations with the likelihood of having any days out of role (versus having none). The second part (5B) shows associations with the number of days out of role among respondents reporting one or more days out of role. Relationships with any days out of role are significant for three of the four domains in bivariate models, and these relationships are sustained when statistical adjustment is included for demographic characteristics. These relationships are reduced in magnitude with additional adjustment for psychological distress, but statistical significance is sustained. The significant odds ratios range from 1.33 for discrimination in the social domain to 1.82 for discrimination in the institutional domain. When all four domains are entered

simultaneously, only the institutional domain remains significantly associated with having days out of role (OR = 1.72, 95% CI = 1.17 to 2.55). The combined scale of total perceived discrimination is significantly associated with any days out of role after adjustment for demographic characteristics and psychological distress (OR = 1.2, 95% CI = 1.10 to 1.30).

Among respondents reporting one or more days out of role, bivariate relationships of the discrimination domain scores with the number of days out of role are all statistically significant, with effect sizes ranging from 19.1 days for social discrimination to 48.9 days for partner discrimination. Statistical significance of these relationships is sustained when statistical adjustment is included for demographic characteristics. However, with further adjustment for K6 score, only one domain, social discrimination, remains significantly associated with the number of days out of role ($p = .0098$). When all four domains are entered simultaneously, all ORs are reduced and none reach statistical significance, but the direction of effect remains toward an association of greater discrimination with more days out of role for three of the four domains. The combined scale of total perceived discrimination is significantly associated with days out of role ($p = .0175$) in the model controlling for demographic characteristics and psychological distress, with each endorsed discrimination item associated with 5.5 days out of role.

Fit statistics for the models shown in Table 5 suggest an adequate representation of the data. The logistic regression model in 5A with demographics, the K6, and the four domain scores as predictors has a c statistic of .75, in the range considered “reasonable” (Hosmer & Lemeshow, 2005). The corresponding OLS model in 5B has an R^2 of .20 and a highly statistically significant F statistic ($p < .0001$).

To summarize the impact of perceived discrimination on days out of role, combining results of the two models shown in Table 5, we used the method recycled predictions, a model-based simulation. The impact of discrimination was calculated by comparing the predicted number of days out of role under two conditions, one with the actual discrimination scores and one where the discrimination scores are artificially set to zero. The estimates were based on the models with adjustment for demographics, the K6, and the four discrimination domains. Simulating removal of the effect of discrimination in all domains resulted in a total decrease of 39.4 (SE 11.3) days out of role in the past year.

DISCUSSION

One of the core motivations for reducing discrimination against individuals with mental health problems is that discrimination constricts the range of social contexts in which they can fully participate (Gronholm, Henderson, Deb, & Thornicroft, 2017). Reducing such discrimination, it is hoped, would allow people with mental health problems to participate more fully and be more productive. However, to date we have had insufficient empirical data to support this conclusion. The goal of this study was to provide some initial estimates of the direction and the magnitude of potential effects of discrimination on impaired functioning and, by inference, the improvements in functioning that might be expected from a reduction in discrimination.

The CWBS is well designed to address this question for four reasons. First, the sample is designed to be representative of people experiencing mental health problems, so it targets the population that is affected by this type of discrimination. Further, this analysis was conducted in the subsample of CWBS respondents who perceive a need for treatment, indicating that they recognize themselves as having a potential mental health problem. Second, the assessment includes information on perceived discrimination in multiple domains in which individuals might experience discrimination identified in prior research. This allows us to examine whether disability is associated with discrimination in particular domains. Third, the survey includes a standardized instrument for assessing impaired functioning based on days out of role that has been widely used in the psychiatric literature (Ormel et al., 2008). Fourth, we are also able to adjust for differences in serious psychological distress, which is associated with both perceived discrimination and days out of role.

The results regarding the overall association of discrimination with disability are unambiguous. Bivariate associations between each of the discrimination subscales and days out of role are positive, with the exception of partner discrimination, and these associations are largely sustained with additional statistical adjustment for demographic characteristics. Further statistical adjustment for serious psychological distress results in attenuation of these associations, but the associations of three of the four discrimination subscales and the total scale score with the likelihood of having any days out of role remain statistically significant. This set of findings provides support for the claim that reduction in discrimination could potentially improve the role functioning of individuals with mental illness.

Model-based simulation using the recycled predictions approach suggests that discrimination has a high cost in days out of role for this population. Removing the effect of discrimination, assuming the associations in the model are causal, results in a reduction of days out of role of 39.4 days in the past year. As expected, this estimate is larger than the estimated average disability level for individuals with mental illness from general population surveys because the sample is composed of individuals with psychological distress. In this sample, 80% report at least one day out of role due to a mental health condition, while about 15% report days out of role in general population samples (Alonso et al., 2011). Given the average number of days out of role due to mental illness reported in this psychologically distressed sample, 86.4 days, a reduction in days out of role of 39.4 days would amount to a 46% reduction in the average days out of role.

The results are less clear with respect to identification of effects of particular domains of discrimination on disability. Correlations among the subscale scores are high, indicating that an individual who perceives discrimination in one domain is likely to perceive discrimination in other domains as well. These associations could be due to severity of illness, specific characteristics of illness that are likely to be targets of discrimination, or to individual differences in perception of discrimination (Lewis, Cogburn, & Williams, 2015). When all subscales are entered simultaneously, the associations with days out of role are appreciably attenuated, suggesting these strong correlations affected our ability to make reliable estimates for each domain.

Despite this limitation, two conclusions about these domains can be drawn from the multivariate results. First, of the four domains, discrimination by partners appears to have the weakest association with disability. Second, institutional discrimination has the strongest association with having any days out of role, while social discrimination has the strongest relationship with the number of days out of role among those with any. These findings should be considered preliminary until confirmed by future studies.

The primary limitation of this study is its reliance on observational data from a single point in time. The results provide evidence consistent with the hypothesized effect of discrimination, but studies with more robust designs for estimating causal relationships are needed. For this reason it is important to consider alternative explanations for the results. First, there is a potential for reverse causation to contribute to the observed relationship between discrimination and disability days; individuals who are more likely to reduce their productivity due to their illness may incur additional discrimination. For instance, this might occur if absence from work creates a burden for coworkers. Second, reporting bias could artificially inflate the association between discrimination and disability days. Evidence from studies of racial discrimination suggests that psychological characteristics related to mental illness influence individuals' reports of discrimination (Lewis et al., 2015). If people who are likely to overreport discrimination are also more likely to overreport disability days, then the results reported here would overestimate the strength of this relationship. Adjustment for psychological distress should correct for this potential bias, but we cannot be certain of this. An additional limitation is the lack of information on physical health conditions, which may also have contributed to reports of days out of role. The impact of physical health conditions is likely to have been minimal due to the clear focus of days out of role due to mental health conditions in the survey question. Finally, the response rate for the CWBS was low. However, weighting for nonresponse and statistical adjustment for factors related to nonresponse, age, sex, and race/ethnicity reduces the likelihood that the associations between perceived discrimination and functional impairment were affected.

The association between perceived discrimination, which remains common among adults with serious psychological distress, and days out of role is consistent with the hypothesized impact of discrimination on functional impairment (Alonso et al., 2004). The association is found for reduced productivity at work, for those who are employed, as well as impairment in other critical domains like parenting and other caretaker roles. Impairment due to discrimination would add to the economic costs of discrimination, such as increased health care costs (Evans-Lacko et al., 2014; Osumili et al., 2016), suggested by prior studies. Additional studies are needed to determine the extent to which these associations reflect causal relationships. Studies of days out of role, or role functioning more generally, can contribute to understanding the impacts that discrimination reduction has on quality of life for people with mental illness and for society as a whole.

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TABLE 1

Sample Demographic Characteristics and Prevalence of Days Out of Role

Characteristics	N	%
Age		
18 to 29	81	31.3
30 or over	679	68.7
Sex		
Male	218	36.5
Female	541	63.5
Race/ethnicity		
White	519	53.9
Black	29	6.2
Hispanic	124	32.4
Other	88	7.6
Psychological Distress (K6) Score		
0 to 7	114	12.4
8 to 12	189	24.0
13 or higher	457	63.6
Days out of role		
Had days out of role	597	80.0
Had no days out of role	163	20.0
Total	760	100

Note. Percentages are weighted.

TABLE 2

Means and Standard Errors of Discrimination Items and Scales in the California Well-Being Survey (CWBS)

Item	<i>M</i>	<i>SE</i>
During the last 12 months, because of your mental health problem, how often have you been treated unfairly ...		
<i>Work</i>		
by one or more of your employers?	0.39	0.038
in school or on the job training?	0.35	0.034
by potential employers when looking for a job?	0.27	0.027
<i>Work discrimination</i>	1.01	0.085
<i>Social</i>		
when trying to make or keep friends?	0.57	0.041
by the people in your neighborhood?	0.31	0.030
by your family (not including your spouse or live-in partner)?	0.66	0.031
in your social activities, such as joining organizations, participating in social events, or pursuing your hobbies?	0.38	0.036
in dating or intimate relationships?	0.58	0.039
<i>Social discrimination</i>	2.49	0.136
<i>Institutional</i>		
when trying to find or keep housing?	0.20	0.033
by the police?	0.27	0.033
by other people in the legal system, like lawyers, judges, or corrections officers?	0.24	0.033
by mental health care providers and staff?	0.33	0.040
by physical health care providers or staff?	0.33	0.040
<i>Institutional discrimination</i>	1.38	0.113
<i>Partner</i>		
in your marriage, live-in partnership, divorce, or separation?	0.46	0.031
<i>Total</i>	5.33	0.293

Note. Items are binary, with 1 indicating endorsement. Scales are sums of item scores. Results are weighted.

TABLE 3

Correlations Among Discrimination Scale Scores

Domain	Work	Social	Institutional	Partner
Work	1			
Social	0.61	1		
Institutional	0.65	0.59	1	
Partner	0.35	0.34	0.35	1
Total score	0.84	0.86	0.87	0.50

Note. Correlations are weighted. All correlations are statistically significant with $p < .001$.

TABLE 4

Mean Discrimination Scale and K6 Scores by Days Out of Role

Days Out of Role	N	Discrimination Score				K6
		Work	Social	Institutional	Partner	
None	163	0.54	1.68	0.52	0.38	11.68
One to eight days	75	0.75	1.47	0.98	0.32	12.50
Nine or more days	522	1.18	2.88	1.68	0.50	15.16

Note. Figures in bold indicate significant difference from the no days out of role group.

TABLE 5
Associations of Perceived Discrimination Domain and Total Scores With Disability Days

Discrimination Scale	Bivariate Models			Demographics Adjusted			Distress and Demographics Adjusted			Domain, Distress, and Demographics Adjusted		
	OR	95% CI		OR	95% CI		OR	95% CI		OR	95% CI	
A. Relative odds of having any days out of role ^a												
Social	1.45	(1.19, 1.75)		1.44	(1.17, 1.76)		1.33	(1.07, 1.65)		1.03	(0.77, 1.37)	
Partner	1.51	(0.81, 2.83)		1.72	(0.86, 3.43)		1.41	(0.69, 2.87)		0.86	(0.41, 1.77)	
Institutional	1.88	(1.41, 2.52)		1.96	(1.46, 2.65)		1.82	(1.36, 2.44)		1.72	(1.17, 2.55)	
Work	1.70	(1.31, 2.20)		1.76	(1.33, 2.31)		1.63	(1.22, 2.16)		1.12	(0.78, 1.59)	
Total	1.23	(1.14, 1.33)		1.24	(1.14, 1.34)		1.20	(1.10, 1.30)		n/a	n/a	
B. Number of days out of role among those with >0 days out of role ^b												
	Estimate	95% CI		Estimate	95% CI		Estimate	95% CI		Estimate	95% CI	
Social	19.2	(10.01, 28.31)		20.6	(9.97, 31.29)		14.3	(3.54, 25.06)		11.6	(-7.06, 30.35)	
Partner	48.7	(10.77, 86.72)		39.2	(1.49, 76.88)		29.0	(-6.39, 64.34)		11.6	(-22.55, 45.69)	
Institutional	16.3	(5.14, 27.39)		13.8	(2.33, 25.27)		10.8	(-0.18, 21.78)		3.7	(-12.37, 19.77)	
Work	22.0	(6.29, 37.71)		19.9	(3.47, 36.29)		13.0	(-4.04, 29.96)		-2.0	(-26.62, 22.59)	
Total	8.3	(3.91, 12.64)		7.7	(3.08, 12.23)		5.5	(0.99, 10.00)		n/a	n/a	

Note. Bivariate models are unadjusted for covariates. Demographics adjusted relationships are adjusted for age, sex, and race/ethnicity. Distress and demographics adjusted relationships are further adjusted for K6 score. Domain, distress, and demographics adjusted relationships are further adjusted for scores on all discrimination domain scores.

^aORs represent relative odds of having any days out of role associated with an increase of 1 *SD* in the discrimination scale score.

^bEstimates represent average number of additional days out of role associated with an increase of 1 *SD* in the discrimination scale score.