

2014 INTERNATIONAL OIL SPILL CONFERENCE

**Integrated Mental and Behavioral Health Services to Improve Patient Outcomes and
Clinical Care**

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ABSTRACT 299975:

This presentation will focus on the importance of addressing mental health in the overall response to the Deepwater Horizon Oil Spill. Emphasis will be placed on evidence based, integrated mental and behavioral health services in primary care clinics as an essential component of physical and mental health care. Community surveillance data collected by LSUHSC Department of Psychiatry in the fall of 2010 and one year post spill revealed increased symptoms of depression, anxiety, and posttraumatic stress compared to national norms. Symptoms were higher for individuals directly impacted by the spill. The Mental and Behavioral Health Capacity Project (MBHCP), part of the Gulf Region Health Outreach Program (GRHOP), was developed across the four impacted states of Louisiana, Mississippi, Alabama, and Florida.

In collaboration with the Primary Care Capacity Project (PCCP) and other GRHOP projects, it is designed to decrease disparities in care and develop an evidence-based system of integrated mental and behavioral health services within primary care clinics. In Louisiana, seven impacted parishes, culturally diverse and predominantly rural, were designated for services. Louisiana MBHCP (MBHCP-LA) is applying established principles of collaborative care combining on-site and telemedicine consultation, training, therapeutic services, and care management. It is working with PCCP to develop and utilize a technologically advanced telemedicine system to integrate mental and behavioral health into electronic health records to meet physical and mental health needs. Preliminary analysis of screening and follow-up data beginning in May 2013 from 303 clients who completed measures at intake into services indicates that integrating mental health services in primary care clinics resulted in significant decreases at follow-up in reported depression, generalized anxiety, and posttraumatic stress disorder symptoms. The data showed that the greater the decrease in reported depression, anxiety, and posttraumatic stress symptoms at follow-up, the greater the decrease in physical health symptoms. While the MBHCP-LA integration of mental and behavioral health in primary care clinics in parishes heavily impacted by the Deepwater Horizon Oil Spill has been in place for less than a year, the outcomes are promising in reducing both behavioral and physical health symptoms. The clinics are reporting greater comfort in addressing mental and behavioral health problems as well as more resilience by having mental and behavioral health partners. MBHCP-LA will continue to evaluate improvement in physical and mental health symptoms as well as resilience and quality of life by more fully addressing mental and behavioral health concerns.

INTRODUCTION:

The impact of major oil spill incidents on individuals and the natural environment, and the interaction between impacted people and the environment is complex, with implications for both the psychological and physical status of those affected. Given the interdependence of people, communities, and the environment, affecting everything from one's livelihood to leisure activities, disruption of this interdependence can drastically increase levels of stress and anxiety. Depending on the extent of the damage, alternations in life style and expectations, and uncertainty about the future, the negative effects of the oil spill may persist, resulting in increased sadness and depression. Studies on the mental and behavioral effects of oil spills found increased rates of depression and anxiety following the Exxon Valdez, Prestige, and Sea Empress spills (Palinkas, Petterson, Russell, & Downs, 1993; Gallacher, Bronstering, Palmer,

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Fone, & Lyons, 2007; Carrasco, et al., 2007). Even eight years after the Exxon Valdez disaster, elevated levels of depression, intrusive stress, avoidance, and family conflict in impacted communities have been shown to persist, suggesting that oil spills may have chronic and pervasive effects on wellbeing in the absence of intervention (Picou & Arata, 1997).

The findings of prior studies examining the mental health effects of oil spills were further supported by community surveillance data collected by LSUHSC Department of Psychiatry in communities highly impacted by the Deepwater Horizon Oil Spill (hereafter “Gulf Oil Spill”) in the fall of 2010 and again one year post spill. Surveillance using common measures of population health status revealed increased symptoms of depression, anxiety, and posttraumatic stress compared to national norms. In fact, the Centers for Disease Control (CDC) and National Institute for Occupational Safety and Health (NIOSH) have issued worker safety and vulnerability reports which speak directly to the importance of recognizing and addressing the impact of psychosocial stressors (i.e., stressors involving the interrelation of social factors and individual thought and behavior) on persons involved in oil spill recovery operations. NIOSH urges the use of medical pre-placement evaluation for workers and volunteers who may be participating as part of the oil spill response activities, recognizing the potential dangers and associated physical and behavioral health factors which may place some individuals at greater risk when working in high stress environments (CDC 2010; NIOSH, 2010)

For residents of the Gulf Coast, the ubiquitous physical and economic impact of the oil spill on coastal communities also brought uncertainty, a profound sense of loss of cultural rootedness, trust, and loss of control over what was happening now and in the future to families, friends and the land that has provided their home and livelihood for many generations. As time passes without resolution of the physical and economic issues associated with the psychological concerns of the people, the once transient stressors turn into chronic stressors, which, in turn, can affect mental health and physical health (Couch & Coles, 2011). At the same time, it is well understood in the disaster literature that the majority of people can and do recover from the impact of these highly charged conditions (Bonanno, Westphal, & Mancini, 2011; Masten & Obradović, 2008). Many persons recover without any formal clinical intervention; however, a sizeable minority will require mental health intervention. Persons who experience similar losses and are able to recover more rapidly than others psychologically are often referred to as having greater resilience, meaning the ability to “bounce back” from the psychological impact of the disaster incident. Data from the community surveillance described above conducted in areas impacted by the Gulf Oil Spill showed that residents who reported higher levels of resilience, also had reduced mental health symptoms (Osofsky, Osofsky, & Hansel, 2011).

The Mental and Behavioral Health Capacity Project (MBHCP), part of the Gulf Region Health Outreach Program (GRHOP), was developed across the four impacted states of Louisiana, Mississippi, Alabama, and Florida to address the increased need for mental and behavioral health services following a widespread disaster. In collaboration with the Primary Care Capacity Project (PCCP) and other GRHOP projects, it is designed to decrease disparities in care and develop an evidence-based sustainable system of stakeholder guided, integrated mental and behavioral health services within primary care clinics. In Louisiana, seven impacted parishes, culturally diverse and predominantly rural, were designated for services. All suffered from discrepancies in care; some had no local mental health providers within the parish. Louisiana MBHCP (MBHCP-LA) is applying established principles of collaborative care by combining on-site and telemedicine consultation, training, therapeutic services, and care

management. It is working with PCCP to develop and utilize a technologically advanced telemedicine system to integrate mental and behavioral health into electronic health records to meet physical and mental health needs.

The purpose of this paper was to test initial assumptions of the post disaster integrated community care model. These assumptions are that there are strong associations between mental and physical health symptoms and that, among adults receiving integrated community care for mental health symptoms, symptoms would decrease from an initial intake assessment to a one-month and three-month follow-up. We specifically hypothesized that 1) there would be associations between mental health and physical health symptoms, 2) there would be significant reductions with medium effect sizes from intake to follow up in symptoms and 3) that reductions in mental health symptoms would be associated with change in physical health symptoms.

METHOD:

2.1 Participants

Participants were patients enrolled in a modified interprofessional stepped care treatment program at Federally Qualified Health Centers (FQHCs) and community primary care clinics in designated impacted parishes in south Louisiana. The stepped care treatment model involves close collaboration and communication between primary care and behavioral healthcare professionals. The model provides both physical and mental healthcare within the patient's primary care clinic, increasing access to care and the efficiency of receiving services. Patients are identified through primary care provider referral to mental health clinicians working within the FQHCs. Mental health clinicians conduct initial evaluations to establish need for specialized mental health services and form treatment plans. Including an initial pilot program, 303 adults (30% males and 70% female) have been screened for mental health symptoms at intake to services. Since May 2013, at the onset of follow-up procedures, 119 have received follow-up at one month and 79 have received follow-up at three months.

2.2 Measures

Health Symptoms (PHQ-15). The Patient Health Questionnaire (PHQ-15) is a 15 item scale developed to assess physical complaints, and has recently been used to assess somatic symptom severity and somatization associated with somatoform disorders (Kroenke, Spitzer, & Williams, 2002; Spitzer et al., 1994). Participants rate how often 15 physical symptoms have bothered them in the past month on a 3 point scale of 0 *not at all*, 1 *several days*, or 2 *more than half the days*. Higher scores indicate more physical symptoms. The scale is reliable, valid, and sensitive to treatment change (Kroenke et al., 2002). Internal consistency reliability estimate for the PHQ-15 at intake (i.e., coefficient alpha) for the current sample was good (alpha = .84).

Depression (PHQ-8). The PHQ-9 is a 9-item scale developed to assess the presence and severity of depression. Participants rate how often they have been bothered by each of 9 symptoms of depression in the past 2 weeks on a scale of 0 *rarely (none of the time, <1 day)*, 1 *some (a little of the time, 1-2 days)*, 2 *occasionally (a moderate amount, 3-4 days)*, and 3 *most of the time (5-7) days*. Although the full PHQ-9, including the suicidality item, was administered at intake, the PHQ-8 was administered during follow-up interviews conducted by phone and was used an outcome measure for this study. The PHQ-8 has been evaluated in the literature and shown to be reliable, valid, and sensitive to treatment outcomes (Kroenke & Spitzer, 2002).

Average item rating on each of the PHQ-8 items was used in this study, and internal consistency reliability was good at intake (coefficient alpha = .87).

Anxiety (GAD-7). The GAD-7 is a 7-item scale initially developed to aid in diagnosis of generalized anxiety disorder (Spitzer, Kroenke, & Williams, 2006). This scale has also been shown to have good sensitivity and specificity as a screener for panic, social anxiety, and PTSD (Kroenke, Spitzer, Williams, Monahan, & Löwe, 2007). Participants rate how frequently they have been bothered by seven anxiety symptoms in the past 30 days on a scale of 0 *not at all*, 1 *several days*, 2 *over half the days*, or 3 *nearly everyday*. The GAD-7 is reliable, valid, and sensitive to treatment change (Spitzer et al., 2006). Average item rating on the scale was used, with excellent reliability at intake (coefficient alpha = .92).

PTSD symptoms (PCL-C). Posttraumatic stress disorder (PTSD) symptoms were assessed using the PTSD checklist, civilian version (PCL-C; Blanchard, Jones-Alexander, Buckley, & Forneris, 1996). On this 17-item scale, participants rate how often they have been bothered by posttraumatic stress symptoms on a scale of 1 *not at all*, 2 *a little bit*, 3 *moderately*, 4 *quite a bit*, or 5 *extremely*. The scale has demonstrated good reliability and validity. Average item rating was used; reliability in the current sample was excellent at intake (coefficient alpha = .94).

Resilience (CD-RISC). The Connors-Davidson Resilience Scale (CDRISC) assesses resilience in adults (Connor & Davidson, 2003). The current study used the 2-item version of the scale, which has demonstrated reliability and sensitivity to treatment change (Vaishnavi, Connor, & Davidson, 2007). The scale assesses the extent to which respondents indicate they “are able to adapt to change” and “tend to bounce back from setbacks” on a scale of 1 *not true*, 2 *rarely true*, 3 *sometime true*, 4 *often*, 5 *true nearly all of the time*. Average rating across the two items was used in this study, with higher ratings indicating more resilience. Reliability on the scale for the current sample at intake was good (coefficient alpha = .71).

2.3 Procedures

Patients were referred for mental health services by their primary care providers (PCPs) based on their clinical impressions or patient request. After patients were referred for mental health services, they were screened for inclusion and exclusion criteria. All participants completed informed consent. Following informed consent, participants were assessed at intake, and at 1 month and 3 months following their intake date. Intake assessments were completed by paper-and-pencil measure, and follow-up assessments were done by phone interview. Upon entrance to specialty mental health services, patients are evaluated by a licensed psychiatrist or psychologist and given either psychopharmacology and medication management, a brief course of cognitive-behavioral psychotherapy, or both as deemed appropriate by the mental health providers. Patients are then transitioned back to their PCPs for continued care, with consultation with PCPs and direct services for patients available as needed. The study protocol was approved by the Institutional Review Board (IRB) at Louisiana State University Health Sciences Center

2.4 Data Analysis

As noted, hypotheses were tested via correlation analyses and trend analyses using HLM7 (Raudenbush et al., 2011; see also Byrk & Raudenbush, 1987; 1992). HLM was used to estimate the within subject change (random effects, level 1) to test the appropriateness of linear

versus quadratic (curvilinear) trends expected for change pre- treatment to follow up. Level 2 HLM analyses tested the effects of gender on change.

RESULTS:

Examination of the range of symptom scores and distribution indicated that the distributions were appropriate for the planned analyses. There was some mild negative skew for the depression and GAD symptoms (representing the high incidence of elevated depression and anxiety disorder symptoms in the sample) and so main analyses were supplemented with non-parametric analyses and transformations to reduce skew.

Hypothesis 1 Association between Physical and Mental Health

Correlations among measures at intake are presented in Table 1. As expected, the physical health symptoms were strongly associated with each of the mental health indicators (all r 's above .55 or sharing greater than 30% common variance). The association is illustrated by the association of depression with health symptoms in Figure 1. Associations were similar across gender and held when non-parametric Spearman correlations were used (see above the diagonal in Figure 1). In addition, resilience was modestly negatively significantly correlated with each of the mental health indicators as well as physical health symptoms (the greater the resilience, the fewer the symptoms).

Hypothesis 2 Symptom Reductions

Descriptive information on mean level change in symptoms is presented in Table 2 and shows trends in symptom reductions, as well as increases in resilience. To formally test these changes, HLM analyses tested linear and curvilinear trends in the individual growth curves using random slopes and robust standard errors. The results of the HLM analysis of the overall within subject change curves indicated significant linear effects of time for each of the three mental health symptoms as well as physical health and a small limited but significant increase in resilience at three months. These results are summarized in Table 2. Examination of Cohen's d effect sizes (Table 2) show primarily medium effect sizes for changes from intake to both follow up points. Cohen's d is defined as the difference between two means divided by a standard deviation for the data. Cohen's d thus standardizes the effect of an independent variable (in this case, time) on a dependent variable (the measured outcomes GAD-7; PHQ-15 etc.) in standard deviation units. Cohen (1988) outlined the following criteria for gauging small, medium and large effect sizes: small $\geq .20$, medium $\geq .50$, large $\geq .80$.

Hypothesis 3 Change in Mental Health Predicts Change in Health Symptoms

HLM was again used to examine the association of each of the three mental health symptoms with physical health symptoms across assessment points and results are summarized in Table 3. Each of the mental health symptoms was uniquely associated with physical health symptoms. The significant effect of time on physical health becomes non-significant when controlling for the mental health symptoms lending evidence to the idea that change in mental health symptoms may be driving change in physical health symptoms.

DISCUSSION:

The findings of this paper support the effectiveness of the Louisiana MBHCP integrated community care model in addressing the mental and physical health needs of communities impacted by the Gulf Oil Spill. Preliminary analysis of screening and follow-up data beginning in May 2013 indicate that integrating mental health services in primary care clinics resulted in significant decreases at follow-up in clients' reported depression, generalized anxiety, and posttraumatic stress disorder symptoms. The data showed that the greater the decrease in reported depression, anxiety, and posttraumatic stress symptoms at follow-up, the greater the decrease in physical health symptoms. Importantly, analyses also suggested that not only were mental and physical health symptoms correlated, but that decreases in mental health symptoms are driving decreases in physical health symptoms.

In the absence of intervention, oil spills can create chronic and pervasive disruptions in mental and physical health as stressors associated with the spill persist. While the MBHCP-LA integration of mental and behavioral health in FQHCs and primary care clinics in parishes heavily impacted by the Gulf Oil Spill has been in place for less than a year, the outcomes are promising in mitigating these disruptions. In addition to reductions in symptoms, findings revealed a significant increase in resilience in clients receiving integrated care which was associated with decreases in symptoms. The clinic staff also report that the presence of mental and behavioral health partners within clinics has improved their comfort in addressing mental health and resilience issues with their patients. The MBHCP-LA integrated care model appears to foster the adaptive processes characteristic of communities and persons who "bounce back" from the psychological impact of a disaster such as an oil spill.

A key underlying feature of the concept of resilience, and the two pertinent dimensions measured in the current report, is a sense of control over one's internal and external world. This sense of control can be disturbed when disasters change lives in overwhelming ways and create persistent and ambiguous threats. By developing access to integrated healthcare and providing patients with the resources to cope with the stressors associated with the Gulf Oil Spill, MBHCP-LA may help clients regain a sense of control of their personal wellbeing. As both their physical and mental health symptoms decrease, patients may experience the return of the adaptive processes that allow them to successfully confront adversity.

MBHCP-LA will continue to evaluate the response process observed in the preliminary sample in the current report. In the future, a larger sample observed over a longer duration will allow for greater and more nuanced understanding of the mechanisms by which the MBHCP-LA integrated care model improves mental and physical health. Of particular interest is increased knowledge of the relationship between resilience and overall health in this population. Although there is limited research on resilience in the wake of oil spills, literature examining this concept after other types of disasters indicates that a combination of diverse factors, including prior life experiences, developmental history, personality traits, and the availability of social support, influence the degree to which individuals express resilience (Bonanno, Westphal, & Mancini, 2011). Ongoing evaluation of the MBHCP-LA integrated care model will allow for more specific conclusions about how clients and communities may develop resilience after an oil spill, and the particular person-environment linkages that influence its development. Through continued intervention, MBHCP-LA not only aims to reduce health symptoms, but also to support communities in strengthening person-environment linkages by building sustainable health services and engaging people in need of treatment as partners in their care.

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* The Outreach Program was developed jointly by BP and the Plaintiffs' Steering Committee as part of the Deepwater Horizon Medical Benefits Class Action Settlement, which was approved by the U.S. District Court in New Orleans on January 11, 2013 and became effective on February 12, 2014 and is supervised by the court.

Table 1

Correlations among Symptom Measures at Intake

	Physical				
	PTSD	Depression	GAD	Health	Resilience
PTSD		.708**	.675**	.560**	-.181**
Depression	.729**		.645**	.532**	-.122*
GAD	.667**	.650*		.514**	-.107
Physical Health	.580**	.548**	.530**		-.106
Resilience	-.224**	-.132*	-.148*	-.142*	

Notes: Pearson's are below the diagonal, Spearman's are above.

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

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

Table 2. *Descriptive Statistics For change in Symptoms and Summary of HLM Analyses*

						ES	ES
	N	Minimum	Maximum	Mean	S. D.	Intake to 1	Intake- 3
PTSD Intake	248	1.00	5.00	2.98	1.06		
PTSD 1 Month	115	1.00	4.76	2.55	1.05	.41	
PTSD 3 Month	75	1.06	4.76	2.56	.99		.40
Δ coefficient = -.234**		SE = .04					
Depression Intake	288	.00	3.00	1.99	.77		
Depression 1 Month	118	.00	3.00	1.66	.91	.43	
Depression 3 Month	78	.00	3.00	1.53	.84		.60
Δ coefficient = -.234**		SE = .04					
GAD Intake	296	.00	3.00	2.16	.81		
GAD 1 Month	119	.00	3.00	1.67	.93	.60	
GAD 3 Month	79	.00	3.00	1.58	.87		.72
Δ coefficient = -.275**		SE = .04					
Physical Health Intake	287	.00	2.00	.92	.41		
Physical Health 1 Month	116	.00	1.73	.79	.41	.32	
Physical Health 3 Month	78	.07	1.57	.83	.40		.22
Δ coefficient = -.072**		SE = .02					
Resilience Intake	294	.00	4.00	2.42	.94		
Resilience 1 month	117	.00	4.00	2.46	1.17	-.04	
Resilience 3 Month	78	.00	4.00	2.63	.96		-.22
Δ coefficient = .12*		SE = .05					

Notes: Δ = change over time; SE = Standard Error *= significant .05 level; ** = 0.01 level (2-tailed).

Table 3

HLM Estimation of Association between Mental Health and Physical Health Symptoms

	Coefficient	Standard Error	t-ratio	df	p-value
Intercept	0.885	0.032	27.373	267	<0.001
Time	0.003	0.016	0.160	267	0.873
PTSD Symptoms	0.116	0.022	5.225	420	<0.001
Depression	0.125	0.028	4.400	420	<0.001
Generalized Anxiety	0.068	0.024	2.765	420	0.006

Notes: Model $PHQ15_{ij} = \beta_{0j} + \beta_{1j}*(TIME_{ij}) + \beta_{2j}*(PCL_{ij}) + \beta_{3j}*(PHQ9_{ij}) + \beta_{4j}*(GAD_{ij}) + r_{ij}$

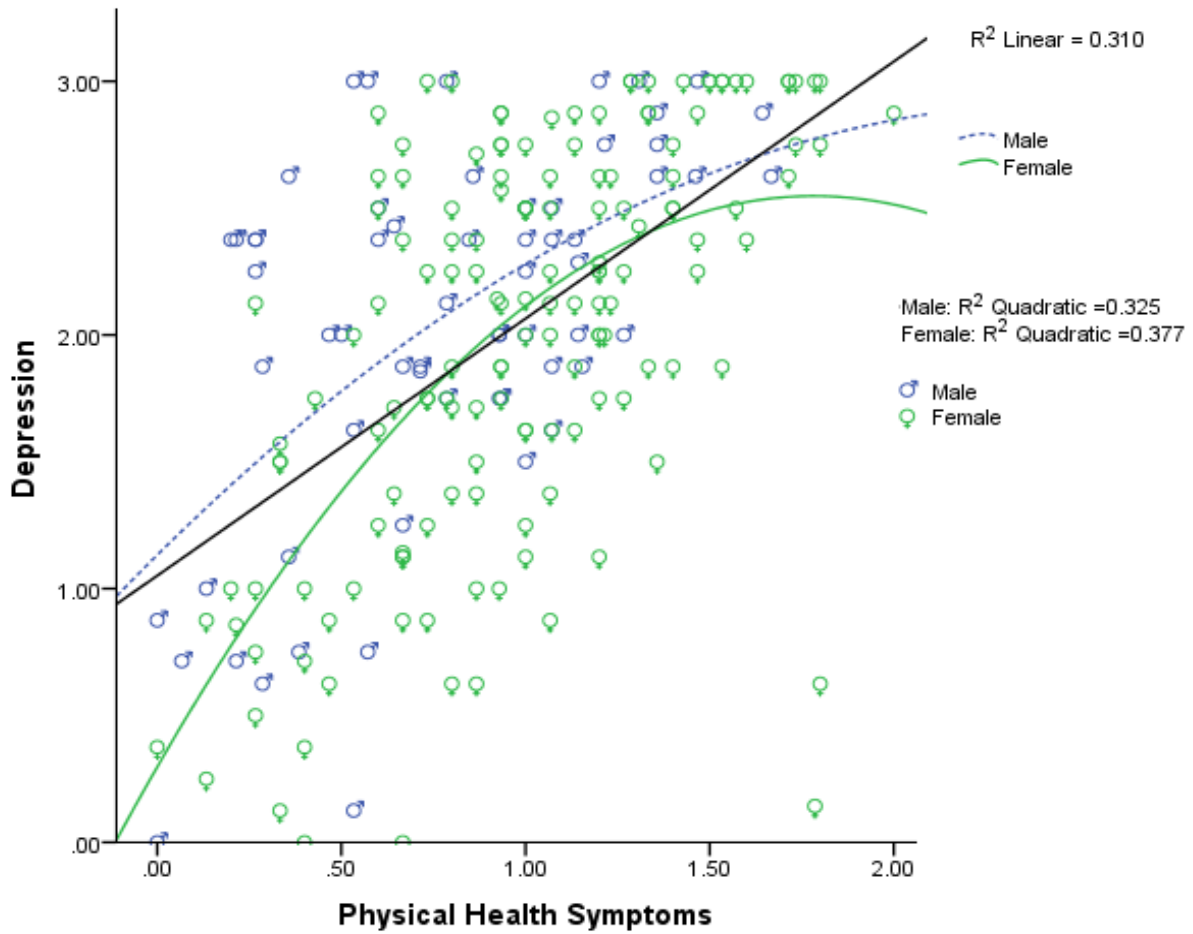


Figure 1

Illustration of the Association between Mental Health (Depression) and Physical Health at Intake

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