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Mental Health Impact of the Deepwater Horizon Oil Spill Among Wives of Clean-up Workers

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To the Editor

The Deepwater Horizon drilling rig exploded in April 2010, resulting in widespread environmental, economic, and population health damage. Previous oil spills have resulted in emotional consequences in local populations that rely on affected areas for their economic and nutritional livelihoods.[1–4] Less is known about the mental health effects among specific subpopulations, particularly women who may have been both directly and indirectly exposed to the oil and dispersants through their husbands who worked on clean-up efforts. The objective of this study is to describe the impact of the Deepwater Horizon Oil Spill on the mental health of female partners of men who participated in oil spill clean-up efforts in southern Louisiana.

We enrolled 252 female partners of male participants in the National Institute of Environmental Health Sciences Gulf Long-term Follow-up Study.[5] Participants resided in

coastal Louisiana parishes and responded to a telephone survey between November 2011 and June 2013. The Louisiana State University Health Sciences Center Institutional Review Board reviewed and approved the study and granted a waiver of documentation of informed consent. Participants provided verbal informed consent. Details on the methods and results can be found in the eAppendix (http://links.lww.com/EDE/A909). Participants were predominantly white (71%), had a high school education (84%), earned less than $50,000/year before the spill (58%), and had a mean age of 47 years (SD 12.9). Almost half the women or another household member worked in the commercial fishing industry.

The prevalence of depression in the sample was 31%, 33% reported increases in domestic fights, 31%–32% reported memory loss post-spill, and 39%–43% reported an inability to concentrate post-spill. An index representing total exposure to the spill, including both direct physical exposure to the oil/dispersants as well as indirect economic impact from the consequences of the oil spill, was constructed from 12 questionnaire items (mean 4.2 ± 2.39, out of a possible range of 0–12) and further subdivided into physical exposure (mean score 1.6 ± 1.19, out of a possible range of 0–6) and economic exposure indices (mean score 2.4 ± 1.50, out of a possible range of 0–6).

Table presents adjusted models for the relation between each mental health outcome and total exposure to the spill (Model 1) and physical and economic exposure to the spill (Model 2). For every unit increase in total exposure, the odds of depressive symptomatology increased by 14% (odds ratio [OR]: 1.1, 95% confidence interval [CI] = 1.0, 1.3); the number of partner fights increased by 35% (OR: 1.4, 95% CI = 1.2, 1.5); memory loss in the past month and immediately post-spill increased by 23% (OR: 1.2, 95% CI = 1.1, 1.4) and 32% (OR: 1.3, 95% CI = 1.2, 1.5), respectively; and inability to concentrate, in the past month and immediately post-spill, increased by 20% (OR: 1.2, 95% CI = 1.17, 1.4) and 27% (OR: 1.3, 95% CI = 1.1, 1.4), respectively.

After adjustment for economic exposure, for every unit increase in physical exposure, the odds of depression increased by 47% (OR: 1.5, 95% CI = 1.1, 1.9), and the odds of more partner fights increased by 38% (OR: −1.4, 95% CI = 1.1, 1.8). Similarly, for every unit increase in physical exposure, the odds of experiencing memory loss in the past month and post-spill increased by 38% (OR: 1.4, 95% CI = 1.1, 1.8) and 45% (OR: 1.5, 95% CI = 1.1, 1.9), respectively, whereas the odds of experiencing an inability to concentrate in the past month and post-spill increased by 39% (OR: 1.4, 95% CI = −1.1, 1.8) and 57% (OR: 1.6, 95% CI = 1.20, 2.04), respectively. After adjustment for physical exposure, economic exposure was only associated with an increase in the number of partner fights (OR: 1.4, 95% CI = 1.1, 1.7) and memory loss post-spill (OR: 1.3, 95% CI = 1.0, 1.6).

These results suggest that exposure to the Deepwater Horizon Oil Spill was associated with depression, increase in domestic partner fights, memory loss, and an inability to concentrate among female partners of oil spill clean-up workers. When exposure is divided into its separate physical and economic components, depression, memory loss in the past month, and inability to concentrate are associated with physical but not economic exposure, whereas domestic partner fights and memory loss post-oil spill remain associated with both types of exposure.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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TABLE

Adjusted Odds Ratios and 95% Confidence Intervals for Total Exposure to the Deepwater Horizon Oil Spill and Each Mental Health Outcome (Model 1) and for Physical and Economic Impact Exposure to the Oil Spill and Each Mental Health Outcome (Model 2)

		Model 1	Model 2	
		Total Exposure	Physical Exposure	Economic Impact Exposure
	N	OR (95% CI)	OR (95% CI)	OR (95% CI)
Depression[a]	245	1.1 (1.0, 1.3)	1.5 (1.1, 1.9)	1.0 (0.8, 1.2)
Increase in number of fights with partner[a]	242	1.4 (1.2, 1.5)	1.4 (1.1, 1.8)	1.4 (1.1, 1.7)
Memory loss past month[a]	245	1.2 (1.1, 1.4)	1.4 (1.1, 1.8)	1.2 (1.0, 1.5)
Memory loss post-oil spill[a,c]	241	1.3 (1.2, 1.5)	1.5 (1.1, 1.9)	1.3 (1.1, 1.6)
Inability to concentrate past month[a]	244	1.2 (1.1, 1.4)	1.4 (1.1, 1.8)	1.1 (0.9, 1.4)
Inability to concentrate post-oil spill[b,c]	240	1.3 (1.1, 1.4)	1.6 (1.2, 2.1)	1.2 (0.9, 1.4)

[a] Model adjusted for race (African American, multi/other, and white).

[b] Model adjusted for race (African American, multi/other, and white) and alcohol consumption status (never, former, current drinker).

[c] Post-oil spill refers to the 8-month window immediately after the Deepwater Horizon drilling rig explosion that occurred on April 20, 2010.