

## Impact of the *Body Worlds* Exhibition on Mental Health Indices and Death-Related Fears: A Before-After Study

**To the Editor:** Exposure to cadavers is usually considered a distressing experience with detrimental effects and is typically studied within the context of psychological trauma.<sup>1</sup> However, most research on students in the medical field has asked students to think hypothetically about their death, and the study of actual exposure to cadavers outside the university context is scarce.<sup>2</sup> Little is known about how voluntary exposure of the general population to cadavers immediately impacts mental health indices, including stress, depressive symptoms, death anxiety, and death-related fears.

The controversial *Body Worlds* exhibition is a worldwide exhibition presenting preserved whole bodies and organs and body slides.<sup>3</sup> This exhibition is controversial due to ethical concerns and the potential deleterious mental health effects of exposure to cadavers. The limited research on this exhibit has only briefly, retrospectively assessed the attitudes and emotions of visitors.<sup>3</sup> We sought to explore in more detail mental health responses and death-related fears employing a before-after design.

**Method.** We conducted a before-after longitudinal design survey on voluntary participants who attended the *Body Worlds* exhibition in Tel Aviv, Israel, during May to October 2012. It is estimated that about 50,000 people visited the exhibition. The survey took place at the entrance and exit of the exhibition. The sample consisted of 398 participants before the exhibition and 286 after the exhibition (response rate = 72%). Mean age of respondents was 32.33 (SD = 12.05) years, 171 were women (59.8%), 123 were married (43.0%), and the mean years of education was 14.26 (SD = 2.97). Although we obtained the profession of the participants, the number of participants who were health or mental health professionals was very small. Moreover, due to the nature of the before-after field study, we collected only basic demographics.

The study was approved by the ethics committee of the School of Social Work at Ariel University, Ariel, Israel.

Posttraumatic symptoms were measured by the 6-item short Impact of Event Scale-revised<sup>4</sup> ( $\alpha$  before the exhibition = .85;  $\alpha$  after the exhibition = .87). Depressive symptoms were measured by the 10-item short Center for Epidemiologic Depression scale<sup>5</sup> ( $\alpha$  before the exhibition = .79;  $\alpha$  after the exhibition = .81). Death anxiety was measured by the item "I am afraid of death."<sup>6</sup> Death-related fears were measured by 3 questions: "I'm afraid to be (1) diagnosed with terminal illness, (2) the victim of a terror attack, and (3) involved in a serious motor vehicle accident." All statements were rated on a 5-point Likert scale from 1 = strongly disagree to 5 = strongly agree.

We used repeated measures analysis of variance for all measures along with Cohen  $d$  for effect size.

**Results.** The results showed a significant decline in posttraumatic symptoms ( $F = 7.29$ ;  $P = .008$ ; Cohen  $d = 0.42$ ), depressive symptoms ( $F = 15.24$ ;  $P < .001$ ; Cohen  $d = 0.48$ ), and death anxiety ( $F = 6.62$ ;  $P = .011$ ; Cohen  $d = 0.31$ ). The same pattern emerged for the death-related fears of terminal illness ( $F = 19.35$ ;  $P < .001$ ; Cohen  $d = 0.54$ ), terror attack ( $F = 7.95$ ;  $P = .005$ ; Cohen  $d = 0.35$ ), and motor vehicle accident ( $F = 11.79$ ;  $P = .001$ ; Cohen  $d = 0.42$ ). (See Table 1.)

**Discussion.** The results revealed that voluntary exposure to cadavers within a controlled setting has a beneficial effect on mental health indices and death-related fears. Exposure to cadavers in a safe and sterile setting increases familiarity with human anatomy and may reduce uncertainty associated with images of dead bodies. In addition, viewing cadavers as plastic figures or statues, or looking at the bodies from an academic or clinical viewpoint, may encourage psychological and cognitive coping mechanisms such as acceptance that may help reduce anxiety.

**Table 1. Mental Health Indices and Death-Related Fears Before and After Exposure to Cadavers (N = 286)**

Variable	Before	After	Repeated Measures		
	Exhibition, Mean (SD)	Exhibition, Mean (SD)	F	P	Cohen d
Posttraumatic stress disorder symptoms <sup>a</sup>	7.47 (5.36)	6.67 (5.34)	7.29	.008	0.42
Depressive symptoms	4.14 (3.48)	3.57 (3.53)	15.24	<.001	0.48
Death anxiety	2.73 (1.23)	2.58 (1.17)	6.62	.011	0.31
Death-related fears					
Terminal illness	3.34 (1.21)	3.11 (1.22)	19.35	<.001	0.54
Terror attack	2.88 (1.26)	2.72 (1.26)	7.95	.005	0.35
Motor vehicle accident	3.10 (1.24)	2.89 (1.26)	11.79	.001	0.42

<sup>a</sup>Respondents for PTSD symptoms: n = 240 before the exhibition, n = 169 after the exhibition.

Limitations of this study include the convenience sample and selection bias among participants voluntarily attending the exhibition and completing the self-report survey. In addition, some of the instruments used are not sufficiently sensitive to measure short-term changes in mental health after exposure to stress.

Future studies should expand this study in order to obtain more data beyond basic demographics and mental health indices. In addition, other groups are likely to be exposed to cadavers (for example, first responders or military personnel),<sup>7,8</sup> in which case the use of a controlled and sterile setting for exposure to cadavers may help reduce probable psychological distress.

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