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Brief report

Face it: Collecting mental health and disaster related data using Facebook vs. personal interview: The case of the 2011 Fukushima nuclear disaster

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ABSTRACT

Collecting mental health data during disaster is a difficult task. The aim of this study was to compare reported sensitive information regarding the disaster and general questions on physical or psychological functioning between social network (Facebook) interview and face-to-face interview after the 2011 Fukushima nuclear disaster. Data were collected from a battery of self-reported questionnaires. The questionnaires were administered to 133 face-to-face participants and to 40 Facebook interviewees, during March–April 2011. The face-to-face interview group showed a significantly higher level of posttraumatic stress disorder (PTSD) symptoms and elevated risk for clinical level of PTSD and reported more worries about another disaster, lower life satisfaction, less perceived social support and lower self-rated health than the Facebook group. Our data may suggest that the reliability of internet surveys is jeopardized during extreme conditions such as large-scale disasters as it tends to underestimate the reactions to such events. This indicates the discrepancy from data collected in situ to data collected using social networks. The implications of these results are discussed.

1. Introduction

On March 11, 2011, Japan was struck by a magnitude 9.0 Mw earthquake. The results were severe as more than 15,000 people were killed by the earthquake and the following tsunami (Normile, 2011). The aftermath of the disaster was a level 7 nuclear meltdown in Fukushima, matching only the Chernobyl disaster (Weissmann, 2011). The literature of behavioral reactions after nuclear disasters is scarce (Baum et al., 1983; Anspaugh et al., 1988; Havenaar et al., 1997), mainly addressing anxiety. Collecting data after large disaster is uncommon (Ben-Ezra and Soffer, 2010). Moreover, collecting information after large-scale disasters is problematic and the option to gain access to survivors is complicated and may suggest the use of the internet. However, collecting data using anonymous internet surveys for screening purposes is unreliable when dealing with mental health and sensitive information (Gosling et al., 2004; Bowling, 2005). A way to overcome this is by establishing personal connections and obtaining reliable data via the use of social networks like Facebook. Using Facebook is important as it gives us the ability to obtain sensitive information in a non-anonymous fashion. This social network, like others, gives the option to conduct interviews and administer questionnaires targeting populations that are inaccessible due to a disaster. Our aim was to examine the existence of possible differences in collecting mental health and disaster-related data between a Facebook sample and a traditional face-to-face sample after the 2011 Fukushima nuclear disaster. This is of importance to psychiatry and mental health, as sometimes diagnosis and intervention can only be made via internet infrastructure whereas other ways of communication are inaccessible. Based on previous reviews (Gosling et al., 2004; Bowling, 2005) to date, no study has compared participants who answered personal interviews to participants who answered through an internet social network (Facebook). This is an exploratory research approach, as no similar studies have yet been conducted in this context. In addition, in this preliminary study, there is a potential bias due to other factors that impedes the formulation of a sound hypothesis.

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2. Methods

2.1. Study design

The study is composed of two different samples. The first is a convenience sample of 133 Japanese that was collected during the week of April 24, 2011. In this sample 86 were women (65.6%), most of them were not married or living in cohabitation ($n=86$; 68.8%), and their mean distance from Fukushima was 271.1 (127.77) km. The second is a Facebook sample of 40 Japanese conducted during March–April 2011 in which internet interviews were conducted along with questionnaire administration. The sample consisted of 15 women (37.5%) and most of them were not married ($n=35$; 87.5%). Their mean distance from Fukushima was 247.8 (194.63) km. The participants from both groups were all exposed to the traumatic event and were affected by the earthquake and the radiation that followed the tsunami.

Each participant was administered a battery of self-reported questionnaires in Japanese that was translated from English and was subsequently translated back to English. The translations were conducted by different people who were fluent in both English and in Japanese.

2.2. Measures

The survey included demographic questions (age, gender, marital status).

2.2.1. Specific data (sensitive)

Disaster-related questions included the following: "Since the Fukushima disaster, do you think of Hiroshima and Nagasaki?", "Since the Fukushima disaster, are you afraid of radiation exposure?" These questions were answered on a 4-point Likert scale ranging from 1 (not at all) to 4 (very much) and "what is the distance from your residence to Fukushima in kilometers?"

Worries about future disasters were measured by the following item: "how worried are you about the occurrences of following future disasters?" (nuclear disaster, tsunami, earthquake, any other disaster) answered on a 5-point Likert scale ranging from 1 (not at all) to 5 (very much).

Posttraumatic stress disorder (PTSD) symptoms were assessed by the 22-item Impact of Event Scale-Revised (IES-R) (Weiss and Marmar, 1997). This scale was rated from 0 (not at all) to 4 (extremely) and represents the participants' distress regarding the Fukushima disaster in the past week. The IES-R total score ranges between 0 and 88 (Cronbach's $\alpha=0.915$). An IES-R score of 33 and above is an indication of elevated risk for clinical levels of PTSD (Creamer et al., 2003). This measure has been used previously and was found to be suitable in other traumatic events such as the Second Lebanon War in 2006 (Ben-Ezra et al., 2007; Palgi et al., 2009), Gaza War in 2008–2009 (Ben-Ezra et al., 2011) and Haiti's Earthquake in 2010 (Ben-Ezra and Soffer, 2010).

2.2.2. Non-specific data (non-sensitive)

Life satisfaction was assessed by a single item question: "In general, how satisfied are you with your life?" answered on a scale ranging from 1 (very dissatisfied), to 4 (very satisfied). This single item measure was found to be valid and highly associated with objective indicators of well-being (Oswald and Wu, 2010).

Self-rated health was assessed by a single item question: "In general, how do you rate your health?" answered on a scale ranging from 1 (bad) to 4 (excellent). This single item measure was found to be valid and highly associated with objective indicators of health (Benyamini et al., 2003).

Perceived social support was assessed using a single item question taken from the SF-36 (Ware et al., 1993) "In general, are you satisfied with the social support you receive?" answered on a scale ranging from 1=not at all to 5=very much.

Meaning in life was measured by the Meaning in Life Questionnaire (MLQ) (Steger et al., 2006) that was used to assess the degree to which participants felt that their lives were meaningful. In the present study we used the 5-item meaning presence subscale. Items are rated on a 7-point scale ranging from 1 (absolutely untrue) to 7 (absolutely true); thus scores could range from 7 to 35 (Cronbach's $\alpha=0.910$).

2.3. Procedure

The traditional sample was assessed by using interviews (face-to-face) along with administration of self-report questionnaires. The Facebook participants were initially contacted by the interviewers; after giving their approval, the participants were asked to fill out self-report questionnaires that were sent back by mail. The interviewer then contacted the participants via Facebook in order to verify the details sent by mail. The email verification process was another layer in order to revalidate the benefit of using ian nternet social network.

Each participant had signed an informed consent form. The study was approved by the Institutional Review Board in the School of Social Work in Ariel University Center of Samaria.

2.4. Data analysis

Japanese participants from the two groups (Facebook vs. interview) were compared using t-tests and chi-square tests for the following variables: demographics (age, gender, marital status), disaster-related factors (thinking about Hiroshima and Nagasaki, fear of radiation exposure, distance from Fukushima in kilometers), worries concerning the occurrence of future disasters (nuclear disaster, tsunami, earthquake, any other disaster), PTSD symptoms (IES-R), psychological factors (life satisfaction, perceived social support, meaning in life) and self-rated health. Cohen's d was calculated in order to obtain the effect size along with a statistical power analysis that assessed type II error (Cohen, 1988). In order to control the unequal number of participants in each group, we have employed Levene's Test of Equality of Variances (Gastwirth et al., 2009). Finally, in order to address any differences in demographics, a set of analyses of covariance (ANCOVAs) were conducted for each of the dependent variables including effect size and observed power. The adjusted variables in each ANCOVA were age, gender and marital status. The independent variable was type of sample (Facebook vs. Interview). All analyses were performed using SPSS statistical software (version 19.0, SPSS Inc., Chicago, IL).

3. Results

The results revealed that the face-to-face interview group showed a significantly higher level of PTSD symptoms ($t=-2.259$; $P=0.025$),

Table 1
Comparison between the study variables (Facebook vs. personal interview) ($n=177$).

Variables	Facebook group ($n=40$)	Interview group ($n=133$)	Test statistics	P-value	Cohen's d	Observed power
Age, Mean (S.D.)	28.7 (8.98)	28.7 (9.02)	$t=0.009$	0.993	0.002	0.999
Gender, n (%)			$\chi^2=3.160$	0.002		
Male	25 (62.5)	45 (34.4)				
Female	15 (37.5)	86 (65.6)				
Marital status			$\chi^2=2.321$	0.020		
Married/cohabitation, n (%)	5 (12.5)	39 (31.2)				
Not married/cohabitation	35 (87.5)	86 (68.8)				
Distance from Fukushima, Mean (S.D.)	247.8 (194.63)	271.1 (127.77)	$t=-0.777$	0.438	0.140	0.977
Rumination on Hiroshima and Nagasaki, Mean (S.D.)	2.03 (0.86)	2.00 (0.85)	$t=0.162$	0.872	0.029	0.997
Fear of radiation exposure, Mean (S.D.)	2.63 (0.70)	2.78 (0.82)	$t=-1.045$	0.298	0.188	0.958
Another nuclear disaster, Mean (S.D.)	3.33 (1.14)	3.43 (1.20)	$t=-0.481$	0.631	0.087	0.990
Another tsunami, Mean (S.D.)	3.03 (1.09)	3.25 (1.22)	$t=-1.036$	0.302	0.187	0.956
Another earthquake, Mean (S.D.)	3.48 (0.96)	3.73 (1.16)	$t=-1.260$	0.209	0.227	0.935
Other disaster, Mean (S.D.)	2.70 (1.18)	3.44 (1.15)	$t=-3.526$	0.001	0.636	0.287
Life satisfaction, Mean (S.D.)	3.13 (0.64)	2.31 (0.75)	$t=6.212$	0.001	1.120	0.119
Perceived Social Support, Mean (S.D.)	2.78 (0.97)	2.02 (1.00)	$t=4.195$	0.001	0.756	0.119
Meaning in Life, Mean (S.D.)	22.58 (8.75)	20.27 (7.13)	$t=1.683$	0.094	0.303	0.861
Self-rated health, Mean (S.D.)	2.68 (0.86)	2.26 (0.75)	$t=2.949$	0.004	0.532	0.445
Impact of Events Scale-Revised (IES-R), Mean (S.D.)	18.87 (11.21)	25.57 (17.69)	$t=-2.259$	0.025	0.407	0.695

had a higher proportion of those with an elevated risk for clinical level of PTSD ($\chi^2 = 2.089$; $P = 0.037$) and reported more worries about an 'other disaster' ($t = -3.526$; $P = 0.001$). Moreover, the face-to-face interview group reported lower life satisfaction ($t = 6.212$; $P = 0.001$), less perceived social support ($t = 4.195$; $P = 0.001$) and lower self-rated health ($t = 2.949$; $P = 0.001$) than the Facebook group. See Table 1 for more details.

The results of the ANCOVA revealed that the interview group had more thoughts about the occurrence of 'other disaster' in the future ($F = 8.138$; $P = 0.0005$; partial $\eta^2 = 0.052$; observed power $= 0.809$), lower life satisfaction ($F = 31.607$; $P < 0.0001$; partial $\eta^2 = 0.178$; observed power $= 1.000$), lower perceived social support ($F = 17.684$; $P < 0.0001$; partial $\eta^2 = 0.111$; observed power $= 0.987$), lower self-rated health ($F = 7.829$; $P < 0.006$; partial $\eta^2 = 0.051$; observed power $= 0.794$), and higher level of PTSD symptoms ($F = 4.277$; $P = 0.040$; partial $\eta^2 = 0.028$; observed power $= 0.538$).

4. Discussion

The results revealed that the face-to-face interview group was more vulnerable in comparison to the internet social network group (Facebook). Both everyday events and extreme events can be surveyed by the internet. However, the reliability of internet surveys needs to be interpreted cautiously during extreme conditions such as large-scale disasters (Gosling et al., 2004). Looking at the results, we may assume that the Facebook group report on higher perceived social support. It is possible that they perceived themselves as having enough support during time of crisis by using internet social networks which in turn increase resilience in comparison to the face-to-face interviews. This line of thinking is well established in the literature as the relationship between higher perceived social support and lower psychological distress in the aftermath of a disaster is well known (Norris and Kaniasty, 1996). An implication of this study is the possible use of social networks during disaster in reach out to vulnerable populations, and to use volunteers as first aid mental health supporters supervised by a psychiatrist or mental health professional, much like mental health helplines.

The main limitation of this study is its cross-sectional nature. Another limitation is the small size of the Facebook group and the lack of a control group.

Future studies should conduct longitudinal designs with larger samples in order to learn more about the long-term effects of disasters on exposed populations.

In sum, it seems that during large-scale disasters a combination of both interview- and social network-based methods should be used to gain a better sense of the psychological reactions to adversity. Yet, caution is required in applying this methodology due to its potential biases. The benefit of online social networks is that they provide access to remote populations that are difficult to access during a disaster and and may help to locate people in distress.

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