

The Emotional and Psychological Impact of Mass Casualty Incidents on Forensic Odontologists

REFERENCE: Webb DA, Sweet D, Pretty IA. The emotional and psychological impact of mass casualty incidents on forensic odontologists. *J Forensic Sci* 2002;47(3):539–541.

ABSTRACT: Motivated by the findings of a previous research project, 38 forensic odontologists with known occupational experience of mass casualty incidents completed a questionnaire designed to elicit both quantitative and qualitative data. The questionnaire sought to provide an insight into the psychological and emotional impact of conducting work of this nature. Two psychometric scales were included in the questionnaire, The Positive and Negative Affect scale (PANAS) and the Impact of Events Scale (IOE). In addition, a number of open-ended questions relating to the personal experiences of the respondent during the mass casualty incident were also included. Quantitative findings indicate that on the whole mass casualty incidents resulted in a positive experience for the respondents, although over a third reported being distressed, upset or irritable at some time during the event. Sense of achievement and camaraderie were among the qualitative themes elicited that help explain the positive reactions. Working conditions, politics and the victims were cited as sources of negativity.

KEYWORDS: forensic science, forensic odontologists, mass casualty incidents, psychological impact, emotionality, preparedness

This research builds on a previous investigation into the efficacy of a mock mass disaster training exercise organized by the British Columbia Coroners service and the British Columbia Forensic Odontology Response Team (1). A central goal of this previous investigation was to ascertain whether delegates, having undertaken the training exercise, felt that they were now more prepared to deal with a mass casualty incident (MCI), should they be called upon to do so. In terms of logistical preparedness i.e., likely work roles, duties and responsibilities the answer was a resounding yes, however, in terms of psychological and emotional preparedness delegates were far more circumspect; particularly delegates who had yet to attend a mass casualty incident. It was, therefore, not surprising that a very strong theme to emerge from the research was that it would be extremely useful if odontologists had some idea of the common psychological and emotional reactions experienced by their peers who had attended such incidents.

The first thing to note, therefore, is that this research is fundamentally driven by a perceived need for awareness among forensic

odontologists who have yet to attend a mass casualty incident and as such its purpose is to help address this need. This rationale extends further when one considers that although a substantial body of research exists that addresses the psychological impact of mass disasters on individuals personally involved in the incident (e.g., survivors and the victim's families) (2–7). Substantially less has been written regarding the psychological well being of those occupational groups whose involvement in a mass casualty incident arises voluntarily as a result of their chosen vocation (8).

A possible explanation for this, is the commonly held belief both among the public and to some extent the occupational group itself that this kind of work goes with the territory and as such those involved are expected to cope with its demands. However, this line of reasoning assumes that the work-group concerned knows precisely what all of these demands will be, a line of reasoning brought into question by the previous research mentioned above.

Methodology

Time constraints combined with the dispersed location of the targeted sample group meant that it would not be feasible to conduct in-depth interviews with odontologists who had direct experience of mass casualty incidents. It was, therefore, imperative that the chosen method of data collection was designed in such a way that it was still able to provide an insight into the range of psychological and emotional responses typically encountered during these events. With this mind it was decided to construct a questionnaire that incorporated both quantitative measures of psychological impact/emotionality and a number of sections designed to elicit qualitative data by asking the respondent to provide additional information in their own words.

Quantitative Measures

When attempting to measure psychological distress and/or emotional impact, an array of scales and psychometrics exist that have been developed, tested, employed and validated on many occasions. It was important, therefore, that the measures adopted in the course of this investigation were the most appropriate given our particular line of inquiry. In the end two primary scales were chosen: the Positive and Negative Affect Scale (PANAS) (9) and the Impact of Events Scale (IOE) (10,11).

The rationale for using the PANAS scale was that not only does it tell you something about an individual's perceived emotional and mood states but it does so by measuring positive as well as negative affect. When evaluating emotionality in the context of mass fatalities, it would be easy to assume that it could only have a negative impact. Regardless of the fact of whether this turned out to be the case, the research team did not want to

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Received 25 Sept. 2001; and in revised form 30 Oct. 2001; accepted 31 Oct. 2001.

overlook the possibility that respondents found something positive from their experience.

The IOE scale was utilized because it is designed to measure subjective distress in relation to specific events, in this case working as a forensic odontologist at a mass casualty incident. The scale assesses two dimensions of psychological stress. One is intrusion, characterized by unwanted thoughts and images, troubled dreams, sleeplessness and the other is avoidance, aspects of which include denial of the consequences of events, emotional numbness and many others. Moreover, these are precisely the types of items endorsed by people seeking help for post-traumatic stress disorder.

The final decision to employ the PANAS and IOE scales was governed by the fact that it has been demonstrated that they are both valid and reliable scales. Statistical evaluations of The PANAS scale have shown it to be a robust, stable, valid, and reliable two dimensional structure with excellent psychometric properties (9,12). And based on a psychometric evaluation undertaken by Joseph (13) the continued use of the IES as a measure of intrusive and avoidant processes was endorsed.

Qualitative Measures

Although it was expected that the PANAS and IOE scales would provide an extremely useful insight into the psychological and emotional impact of mass casualty incidents on forensic odontologists it was anticipated that this insight would be limited. For instance, the measures would not be able to determine why a respondent reported a positive or negative experience, what caused their perceived psychological distress or what triggered an intrusive thought. Consequently, in order to accommodate a wider framework of understanding, a range of open-ended questions were included alongside the quantitative measures within the questionnaire e.g., thinking about your mass casualty experience, describe the positive effects on you.

The Respondents

In total 40 questionnaires were sent via regular mail and e-mail to forensic odontologists in Canada and the United States. All 40 respondents were known to have direct experience of working on mass fatality incidents. Thirty-eight completed questionnaires were returned representing a response rate of 95%. Thirty-four of the respondents were male. Over 50% of the respondents were aged between 50 and 64. The number of mass casualty incidents attended ranged from 1 to over 50 with the average being 9. In terms of the highest number of fatalities, responses ranged from 3 to just under 300, with the average being around 90. The most common cause of the mass casualty incidents attended was an airplane crash, followed by vehicular accidents, natural disasters and fire. For a more detailed critique of the demographic make-up of the respondents and its potential implications for future mass disasters, the reader is directed to a supplementary paper published by the authors (14).

Results

Positive and Negative Affect

As can be seen from Fig. 1, responses to the items contained within the PANAS scale produced a very clear pattern. The sample as a whole returned a high positive affect score (mean score 33.88, scale range 10–40) and a low negative affect score (mean score 11.96, scale range 10–40). This in essence means that having attending a mass casualty incident, respondents were far more likely to report that they were enthusiastic, determined, and alert, than re-

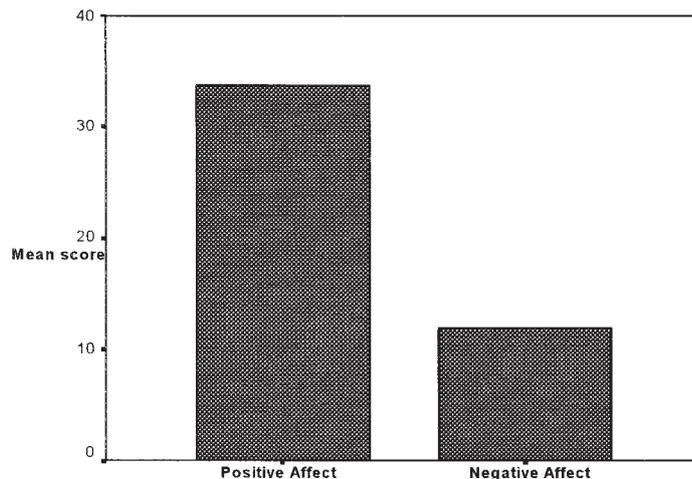


FIG. 1

port that they were unsettled, disturbed, or nervous. The difference in reported positive and negative effect was found to be statistically significant ($t = 21.37$, $df = 23$, $p < 0.05$).

It should be noted, however, that single item analysis revealed that over a third of respondents reported being distressed, upset or irritable at least some of the time, and in some cases, most of the time during the mass casualty incident.

Impact of Events

Scores elicited from the impact of events scale are positively correlated with level of psychological dysfunction, i.e., the higher the score, the higher the psychological dysfunction and conversely, the lower the score, the lower the psychological dysfunction. Mean scores on both the intrusion and avoidance sub-scales were low (13.26 and 11.75 respectively). This indicates that perceived subjective distress was nothing like the level one would expect if respondents felt that they had been severely traumatized by their mass casualty experience. The scores do reveal, however, that the mass casualty experience was more likely to evoke intrusive stress rather than avoidance behavior among odontologists. The most common examples being, thinking about the MCI when they didn't mean to; having unexpected and strong feelings about the MCI; and pictures of the MCI popping into their heads.

Summary of Quantitative Analysis

According to our sample forensic odontologists are telling us that attending a mass casualty incident had a positive rather than a negative affect on their emotions, although for at least a third of them they were sometimes upset, distressed, and irritable. There is no evidence to suggest that the impact of the event was such that it induced psychological dysfunction. However, intrusive thoughts were occasionally reported. It is also worth noting that nothing in the analysis indicated that positive or negative affect or impact of events was mediated by age, gender, or number of mass casualty incidents attended.

The implication that lack of preparedness may not be related to level of experience (as measured by mass disasters attended) is clearly contentious. The skewed nature of the sample, i.e., predominantly consisting of highly experienced odontologists may go some

way to explain this counter intuitive result. Nevertheless, it would be imprudent to ignore the finding and it is one that certainly demands further attention. The authors are not suggesting that experience doesn't buffer the effects of a mass fatality incident; rather they are suggesting that we must acknowledge the context specific nature of each event and the possible unique trigger within that event.

Qualitative Findings

As was alluded to earlier, in order to place the study's quantitative findings within a richer and more illuminative context, the respondent questionnaire was designed to accommodate the extraction of qualitative information. In order to analyze the "personal" data provided by the respondents, the research team subjected the information to a formal content analysis. Content analysis is an accepted research method employed to establish the presence of particular words, concepts or categories within textual material (15). Researchers carry out this process in order that they can analyze the frequency, meaning(s), and relationship(s) of these words, concepts, or categories. This allows the researcher to make inferences regarding the "messages" within the text. As a result of this procedure, we were able to provide reasoned answers to specific questions arising from the quantitative results.

Why Should Attending a Mass Casualty Incident have a Positive Affect on Odontologists?

The most common theme to be elicited was the sense of achievement respondents felt having attended a MCI. Twenty-four out of the 38 respondents made specific reference to this and pointed to things like being able to give the victims' families closure. A very interesting theme to develop was mentioned by approximately a third of a sample, a theme defined as self-reflection. This concerned the fact that having been surrounded by death and destruction respondents were made acutely aware of the fragility of life and this was positive in the sense that it made them re-evaluate things they had previously taken for granted, i.e., spending time with their family. It was also clear from the comments that a majority of respondents felt that the experience gained and the camaraderie that developed in such extraordinary circumstances were invaluable.

What Were the Sources of Distress, Upset, and Irritability for over a Third of the Respondents?

Many respondents commented just how physically and mentally exhausting mass casualty incidents could be. Long hours often in poor working conditions taking its toll was a strong theme. Another relatively strong theme to arise was the politics that can surround a MCI. A number of respondents mentioned how jurisdictional turf wars would detract from getting on with the job at hand and how this could lead to what was seen as interference or resulted in poor communication channels being established. A number of respondents also made reference to the fact that the victims could be a source of distress, particularly if children were involved. Certain respondents talked about being unprepared for the sheer number of fatalities and the damage that had been inflicted.

The qualitative findings were encapsulated in the words of one of our respondents who said.

"For me MFIs (Mass Fatality Incidents) are intense, exhausting and humbling experiences. I have never looked forward to going and I never regretted having been."

Conclusion

It was stated towards the beginning of this paper that this research was undertaken in order to address a perceived need for preparedness among forensic odontologists who have yet to attend a mass casualty incident. Thanks to the cooperation of their peers we now have some idea of the psychological and emotional impact experienced by those who have attended such events. We must, however, seek to build on this information because despite its obvious importance to occupational groups within the context of a mass fatality incident, preparedness has yet to be systematically studied. No clear definition exists; no attempt has been made to measure preparedness; and the potential psychometric properties of preparedness have yet to be explored. By treating preparedness as a theoretical variable there is no reason why it cannot be developed and employed to further explain, understand and inform a range of work related issues before, during and after a mass fatality incident.

Acknowledgments

The authors would like to thank all those who completed the questionnaires and provided such a wealth of information on their experiences.

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