

Acute Stress among Healthcare Staff during a Public Health Emergency in México

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INTRODUCTION

The United Nations through the World Health Organization has shown that crises or disasters can have a profound impact on the population's physical and mental health (World Health Organization, 2003).

In 2009 a new strain of the human influenza virus (AH1N1) appeared and reached pandemic levels, initiating an epidemiological alert in Mexico in April of the same year. Its impact was significant because it was a new subtype of the virus, especially for the severity of the symptoms and number of deaths, which required taking security, hygiene and social isolation measures to reduce the risk of contagion.

In critical periods, clear, direct, objective and timely information is the most important preventive measure. However, when the available information is inadequate, depressive or anxious emotional reactions and distress may be observed in risk behaviours among the general population. Straus and collaborators (2004) suggested that during an outbreak, limited availability of information about the disease can have a negative impact on healthcare staff. In addition, Maunder (2004) highlights the importance of effective risk communication. In the case of healthcare providers, when they are overwhelmed by the emergency, the capacity and quality of the service provided may be affected.

Consistent with this, a number of authors have highlighted the important role played by the sense of uncontrollability and the following factors as contributing to stress: novelty, unpredictability, uncontrollability and threat. Other factors, such as the intensity of the threat, the type of context and risk or protective factors of the individual and group, may contribute to stress (Dikerson & Kemeny, 2004).

McEwen (1998) and McEwen (2006) described two factors that determine the individual's response to stressful situations: 1) the individual's perception of the situation, and 2) the individual's general physical health, which is influenced by genetic and behavioural variables. In addition, McEwen (2006) suggests that other important factors are the individual's early childhood experiences and his or her current life situation. For McEwen, the process of allostasis refers to the individual's capacity to maintain an equilibrium between all these factors so as to promote effective adaptation.

The reactions of individuals and human groups to emergency and disaster situations have been studied from a psychological perspective. As unexpected situations, emergencies put at risk the physical and psychological integrity of the population and, in some cases, even the resources, services and environment. As a consequence, there is a need to develop a specialized intervention that is able to improve outcomes, reduce maladaptive responses, mitigate adverse reactions during the event, promote adjustment and facilitate rehabilitation (Marcuello, 2006; National Institute for Safety and Health at Work, 2015).

During extreme disruptive events, anxiety reactions are frequent and expected, acute stress being particularly common. Dissociative symptoms (subjective feeling of apathy, detachment, derealisation, depersonalization, and dissociative amnesia) are the disorder's key characteristic and appear immediately after the onset of the stressing event, with a one month's duration and producing significant clinical distress and interfering with the patient's global functioning (American Psychiatric Association, 1995).

The prevalence of acute stress disorder depends on the intensity and persistence of the trauma and on the degree of exposure to it. In addition, the quality of social support, the family background, childhood experiences and pre-existent mental disorders influence its onset and maintenance. It has been reported that the lifetime prevalence is between 1% and 12.3%, increasing to almost 90% in individuals with co-occurring medical conditions, exposure to war and combat, and among crime victims (Valencia, 2008).

Previous studies have not reported this type of reaction among health care staff. Some studies have reported a prevalence of work-related stress among healthcare students of 36%, between 22 and 63% among nurses and residents, and of 25% for post-traumatic stress among social workers (Bride, 2007; Carreño et al., 2010; Marti et al., 2005) a percentage that is expected to increase during a public health emergency. Maunder (2004) reported that between 29 and 35% of hospital workers experienced a high degree of distress during the 2003 severe acute respiratory syndrome (SARS) outbreak. This is important because during a threat, emergency or hazard healthcare staff may react like the general population. However, we believe that healthcare staffs are particularly exposed to stress because they have the social responsibility of providing care. In addition, stress may interfere with the activities that need to be carried out as part of their responsibilities, their response capacity may be exceeded by overwhelmed services, tiredness and fear of contagion or other types of risks.

Moreover, since they are responsible for providing care to the population, it is critical that they are in the best physical and emotional conditions.

In this sense, Dikerson & Kemeny (2004) suggest that a social-evaluative threat is likely to occur when an individual's identity is affected by the judgement of others or because of failure, leading to a decreased social esteem which may have an impact on the stress response. These characteristics, and the uncontrollable factors mentioned above, may promote a context of forced failure where the quality of care that is provided may be affected and the individual may feel unable to avoid negative situations.

In these cases, psychological interventions have focused on providing care to patients and their families; however, there is a need to recognise the importance of developing interventions that target healthcare staff because during a public health emergency their circumstances must be in the best possible conditions.

As a consequence, psychologists in health settings need to take an active role in the diagnosis, prevention and treatment of healthcare

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staff in order to evaluate the emotional resources, attitudes and motivation that medics, nurses and paramedics adopt during the health emergency. Mental health professionals also need to determine whether healthcare staff is in good conditions to cope with the situation given that an effective and successful operation depends on this. In addition, they need to anticipate that stress and emotional changes may be reflected in risk behaviours and may have an impact on action programmes.

There is a need to conduct studies that permit the development of diagnostic strategies to assess the magnitude of the problem and the intervention. For this reason, the aim of the present study was to describe lifestyles, behaviours, emotional responses and symptoms of acute stress among healthcare staff, and the possible changes experienced during a public health emergency.

METHOD

- A cross-sectional study was conducted among healthcare staff of a third-level teaching hospital. During the public health emergency, 136 morning shift employees from seven different areas of the institute responded, anonymously, to the following self-report questionnaires after providing informed consent:
- Socio-demographic questionnaire.
- Questionnaire of the diagnostic criteria for acute stress: A measure that examines seven symptoms for the Acute Stress diagnosis according to the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV) (American Psychiatric Association, 1995). To determine the diagnosis of acute stress, two symptoms of criterion A must be present (threat and fear/hopelessness) and three or more dissociative symptoms of criterion B (emotional isolation, obnubilation, derealisation, depersonalization, disintegration). In addition, the persistence and clinically significant distress must be taken into account and these were measured using a five-point Likert scale.
- A list of emotions for participants to rank the five most important ones that were experienced during the health emergency. This measure includes a list of 14 emotions that previous studies have found to be associated with health emergency situations. Participants are asked to rank, from most important to least important, five emotions that were experienced during the emergency. This measure is based on the Natural Semantic Network Analysis that is used to

examine mental representations (Valdéz, 2005). In the present study, the presence or absence of the self-reported emotions was considered.

- Questionnaire of lifestyles, personal behaviours, perceived degree of adaptation and satisfaction, and retrospectively perceived changes that were associated with the health emergency. This questionnaire consists of 27 items and the response options include a three-point and five-point Likert scale.

These measures were developed for the present study.

We conducted descriptive statistics, χ^2 tests to examine the association between variables using contingency tables, Wilcoxon tests and odds ratios. The analysis was conducted using the Statistical Package for the Social Sciences (SPSS) version 14.0.

RESULTS

The survey was completed by 136 participants from seven different areas of the institute. Table 1 shows the distribution of responses among these areas. Participants were 56 males (41.2%) and 80 females (58.8%) and their occupations can be divided into those that involved contact with patients (medics, interns, nurses, nutritionists, psychologists, social workers) and those that did not (administrative staff and cleaning staff). Participants of the former group represented 51.5% of the sample whereas participants from the latter group 48.5%. The age of the participants ranged between 21 and 63 years, with a mean age of 40.4 ± 9.8 years.

Acute stress was diagnosed in 29.4% of the sample. As shown in Table 2, of those participants who met the diagnostic criteria of acute stress, all of them reported symptoms of the diagnostic criterion A of the self-report questionnaire: perception of physical threat and fearful responses, hopelessness or intense fear. Table 2 also shows a high percentage of symptoms reported by participants who did not meet the diagnostic criteria, as well as the odds ratio (OR) and confidence intervals. There were no differences between participants with and without a diagnosis of acute stress in terms of age ($N = 136$, $\chi^2(3) = 5.582$, $p = 0.134$), gender ($N = 136$, $\chi^2(1) = 0.936$, $p = 0.333$), occupation ($N = 134$, $\chi^2(3) = 1.253$, $p = 0.740$), and whether or not they had contact with patients ($N = 134$, $\chi^2(1) = 0.001$, $p = 0.995$).

The most frequently reported emotions were feeling: tense (67.6%), tired (66.2%) fearful (64.0%), sad (39.0%), bored (30.9%)

Table 1.
Institutional areas where the survey was conducted

Area	%
Teaching	8.1
Emergency service	14.7
Outpatient service	20.6
Inpatient service	11.8
Cleaning service	19.1
Administrative	10.3
Research	15.4

Table 2.
Acute stress symptoms

Symptom	% of staff with acute stress (29.4 % N = 40)	% of staff without acute stress (70.6% N = 96)	% of the overall sample (100% N = 136)	Odds ratio	95% CI
Threat	100.0	90.5	93.3	-	-
Fear/hopelessness	100.0	32.6	52.6	-	-
Emotional isolation	90.0	14.6	36.8	15.480	5.854 - 40.934
Obnubilation	76.9	30.9	44.4	4.181	2.157 - 8.103
Derealisation	97.4	34.0	47.7	33.783	4.774 - 239.041
Depersonalization	94.9	23.4	55.6	23.203	5.831 - 92.336
Disintegration	51.3	11.5	77.0	3.531	2.178 - 5.725
Abnormal functioning	62.5	18.8	68.4	3.605	2.125 - 6.114

and exhausted (30.1%). Perceptions of sadness ($N = 136$, $\chi^2(1) = 10.537$, $p = 0.001$) and fear ($N = 136$, $\chi^2(1) = 6.317$, $p = 0.012$) were significantly associated with acute stress, with odd ratios of 3.466 (95% CI 1.608 – 7.470) for sadness and 2.982 (95% CI 1.244 – 7.145) for fear. The following emotions were associated with acute stress: feeling relaxed ($N = 136$, $\chi^2(1) = 7.250$, $p = 0.007$; OR = 0.261, 95% CI 0.093 – 0.727), happy ($N = 136$, $\chi^2(1) = 4.331$, $p = 0.037$; OR = 0.316, 95% CI 0.102 – 0.976), bored ($N = 136$, $\chi^2(1) = 8.971$, $p = 0.003$; OR = 0.228, 95% CI 0.082 – 0.634) and exhausted ($N = 136$, $\chi^2(1) = 6.174$, $p = 0.013$; OR = 0.308, 95% CI 0.117 – 0.805).

The questionnaire asked participants to rate whether they perceived that the H1N1 outbreak and public health emergency produced changes in their lifestyles and personal behaviours. Participants rated the changes as being positive, neutral or negative. The following lifestyles and behaviours were rated as suffering negative changes: leisure activities (57.1%), exercise (41.7%), mood (27.5%), work (22.3%), sleep (19.4%), diet (13.6%), alcohol (6.4%), tobacco (5.4%) and drugs (4.1%). A diagnosis of acute stress was significantly associated with impairments in mood ($N = 131$, $\chi^2(2) = 20.312$, $p = 0.001$) and work performance ($N = 130$, $\chi^2(2) = 5.921$, $p = 0.050$).

The following behaviours showed a significant association with a diagnosis of acute stress: perceived inability to adapt to emergency situations ($N = 129$, $\chi^2(2) = 18.460$, $p = 0.001$), concentration problems ($N = 132$, $\chi^2(2) = 11.269$, $p = 0.004$), increased effort to concentrate at work ($N = 131$, $\chi^2(2) = 19.533$, $p = 0.001$), tension ($N = 131$, $\chi^2(2) = 10.533$, $p = 0.005$), mood changes ($N = 131$, $\chi^2(2) = 9.702$, $p = 0.008$), hopelessness ($N = 132$, $\chi^2(2) = 17.654$, $p = 0.001$), fear of contagion ($N = 127$, $\chi^2(2) = 12.491$, $p = 0.002$) and fear of becoming infected through physical contact with others ($N = 131$, $\chi^2(2) = 22.488$, $p = 0.001$).

Table 3 shows the variables that were significantly associated with acute stress.

Table 3.
Variables associated with acute stress

Variable	χ^2	P
Sadness	10.537	0.001
Fear	6.317	0.012
Mood	20.312	0.001
Work performance	5.921	0.050
Perceived inability to adapt to emergency situations	18.460	0.001
Concentration problems	11.269	0.004
Increased effort to concentrate at work	19.533	0.001
Tension	10.533	0.005
Mood changes	9.702	0.008
Hopelessness	17.654	0.001
Fear of contagion	12.491	0.002
Fear of becoming infected through physical contact with others	22.488	0.001

Table 4.
Variables associated with occupations that involve contact with patients

Variable	χ^2	P
Age	13.727	0.003
Gender	5.839	0.016
Tired	9.940	0.002
Angry	10.466	0.001
Tense	3.922	0.048
Confused	8.513	0.004
Sleeping habits	7.743	0.005
Working habits	8.273	0.016
Leisure activities	9.142	0.010
Exercise habits	19.202	0.001
Stress and tension	9.564	0.008
Awareness of epidemiological risks	5.939	0.050
Awareness of risks in work-related activities	7.216	0.027

Healthcare staff who had contact with patients were more likely to report being female, under 30 years of age, to feel tired, angry, tense, and to have negative feelings in relation to their sleeping, working, leisure and exercise habits (Table 4). In addition, this group reported being aware of the stress, tension, and epidemiological and work-related risks related to the health emergency.

Finally, the questionnaire of lifestyles and personal behaviours asked participants to rate the well-being retrospectively, before the H1N1 outbreak and during the outbreak. The results indicated a significant difference according to the Wilcoxon test, $z = -5.34$, $p = 0.001$. Retrospective self-evaluation levels of well-being were higher before the outbreak (Mdn = 3, mean rank = 33.65) than after it (Mdn = 3, mean rank = 21.55).

DISCUSSION

This study investigated lifestyles, behaviours, emotional responses and symptoms of acute stress among healthcare staff during the H1N1 outbreak in Mexico. As a stressful event a public health emergency has the characteristics of a life-threatening and potentially harmful situation. Acute stress has been conceptualized as a transitory condition that varies in intensity depending on the individual's history and how he or she has dealt with stressful situations in the past. For some people the environmental impact is less threatening because the adaptation to environmental changes depends on the psychological resources that have been used to cope with stressful situations.

Maunder (2004) identifies the following factors to further understand the impact of outbreaks on hospital workers: a) impact on particular groups of healthcare workers, taking into account whether or not healthcare workers have contact with patients and the characteristics of each professional discipline, b) mediating factors such as social isolation, stigma, scrutiny and job stress, c) individual traits that contribute to stress, and d) cumulative effects of multiple factors contributing to stress.

In the context of a public health emergency all health personnel are at risk of contagion during the epidemic outbreak, especially when the agent in question is unknown, as it occurred with infectious agents such as HIV, SARS and most recently H1N1 influenza, where the diagnostic and management protocols were not yet established. As a consequence, the perception of risk is higher than usual, affecting the population's subjective experience and interfering with an efficient and proactive response. According to the theory of uncontrollability, the novel, unpredictable, uncertain and fear are the interrelated forces that contribute to a significant stress response in healthcare workers (Dikerson & Kemeny, 2004; Maunder, 2004).

In this sense, Chorpita and Barlow (1998) and Peterson, Maier & Seligman (1993) (cited in Dikerson & Kemeny, 2004) suggest that the sense of having no control can have negative effects on psychological, physiological and health outcomes. If these are chronic, the individual may experience negative long-term effects.

One of the lessons reported by Sartri and collaborators prioritizes healthcare staff as part of the preventive actions, for reasons that highlight the need of maintaining the health system's working capacity and of preventing contagion with in hospitals that may put the patients and staff at risk (Sarti et al., 2009). To this, we should add the evaluation, intervention and promotion of emotional well-being through the management of acute stress and emotional reactions associated with the pandemic.

There is a lack of evidence on the prevalence of acute stress in public health emergencies as the one experienced in Mexico in 2009, and therefore it is important to highlight that 29.4% of the sample met its diagnostic criteria. Of note, the rest of the sample reported symptoms that, without meeting the diagnostic criteria, suggested a stressful reaction. This finding is consistent with Maunder (2004) who reported that 29% of hospital workers experienced high levels of distress, highlighting the need of identifying risk and protective factors of acute stress among hospital workers. Particularly, it is interesting to find large odds ratios for dissociative symptoms such as derealisation and depersonalization, symptoms that may be disruptive in the delivery of care among healthcare staff who did not meet the diagnostic criteria. The odds ratios for each of the symptoms of acute stress highlights the need of considering them as clinical features of psychological vulnerability in healthcare staff and of considering the degree of interference with their professional duties. Knowledge of the prevalence of acute stress during a public health emergency allows assessing the magnitude of the problem and planning the intervention to be adopted by the mental health team.

Although healthcare staff may react like the general population to the threat, danger and emergency, we believe that they are particularly exposed to stress because they have the social responsibility of providing care to the population. In addition, the stress experienced may interfere with the activities that need to be carried out as part of their duties, and their response capacity may be exceeded by overwhelmed services, tiredness and fear of contagion or other types of risks. Therefore, as service providers it is essential that they are in the best physical and emotional conditions. This is also important because a professional with acute stress is a "nullified" human resource in terms of the capacity to perform those duties that are relevant to the emergency period. This requires that mental health personnel plan psychological interventions in order to influence outcomes such as emotional disturbance, work performance and provision of care under pressure, among others. In this regard Bonanno and collaborators (2008) have recommended the classification of healthcare staff according to how they respond to emergencies, in order to plan activities that ameliorate reactions and to prevent the disruption of health services during the emergency and disaster. In relation to this, Strauss and collaborators (2004) view this as part of the professionalism of healthcare staff, who need to balance providing adequate care of patients with personal risks.

Finally, Maunder (2004) suggests that although acute traumatic stress interferes with functional abilities within a healthcare setting, this is an issue that relates not only to the well-being of healthcare workers but also to the effectiveness of healthcare in general, at a time when attention to detail and professionalism are critical.

For the diagnosis of acute stress it is important to evaluate the perception of how intense is the event, its persistence, the individual's response capacity, psychological resources and the type of functioning that is used for his or her adaptation and adjustment. The perception of threat may have two modalities, one real (health emergency) and another imaginary (e.g., "I may die if I work with patients"), and in both cases the perceived feeling is similar and can be paralyzing when coping with the threat. Especially during the early stages of the health emergency, when rumours and misleading information may result in contradictory information that prevent the development of effective and adaptive mechanisms.

Whether or not the threat is real, imaginary or both, the emotional responses and changes are experienced and are reflected in the individual's global functioning. Participants with acute stress experienced significantly more emotional disturbance with feelings of fear, tension, sadness, disturbance of work performance and attention, concentration and adaptation difficulties.

Straus and collaborators (2004) reported that having contact with patients who have been infected could contribute to feelings of fear and concern, considering the responsibility that involves their medical care, and Maunder (2004) describes it as a contributing factor of acute stress.

Of note, there were no significant differences between healthcare staff with and without direct contact with patients and acute stress. This contrasts with the study conducted by Morales and collaborators (Morales-Carmona, Carreño, Luque & Sánchez, 2009) where direct contact with patients was found to be a source of stress, especially when patients had serious conditions or were at high risk of dead. If we consider the risk of contagion as a real danger, employees with care duties are at a higher risk of contagion. However, the finding that this was an independent variable suggests the presence of subjective intrapersonal features that result from a perception of threat and danger, coupled with distress and tension associated with the emergency. Future studies need to examine this through the mental representation of the imaginary threat. Other independent variables that were not associated with stress were age, gender and occupation.

A possible effect of the social isolation measures that were put into place during the public health emergency was the impairment that was found in lifestyles such as leisure activities and exercise. Of special concern are the percentages of alcohol, tobacco and drug use of almost 6.5% of the sample. This is important because Maunder (2004) and Maunder and collaborators (2004) suggest that from a psychological perspective, social isolation have an immediate interpersonal cost. Additionally, two years after the SARS outbreak was controlled, healthcare workers showed increased rates of chronic stress such as professional burnout, depressive and anxiety symptoms, increased smoking, drinking or problem behavior, work absenteeism and subsyndromal stress responses.

Taking into account the course of acute stress, the reaction is an outcome that needs to be alleviated depending on whether the emergency and its risks take control of the individual, whether it becomes chronic resulting in distress (chronic stress), in other types of anxiety disorders or dysphoric psychological distress associated with dissatisfaction, and reduced activity. In people with pre-morbid disorders it may lead to relapses in each of these conditions. In terms of work-related activities, chronic stress may contribute to the development of burnout syndrome. In all cases, the course of chronic stress results in staff avoiding the source of stress, there by

contributing to absenteeism which aims to reduce the associated stress and symptoms; however, these reactions tend to reappear immediately once the source of stress is experienced again (Aldrete, Pando, Aranda & Torres, 2006).

The psychological interventions that have been proposed for this type of emergencies recommend distinguishing the event qualitatively as an emergency situation, disaster or catastrophe in relation to organizational and economical aspects (Marcuello, 2006). In designing the intervention, it is important to consider the characteristics of the event, the people and institutional context with a flexibility that takes into account the conditions that arise in the course of the emergency. This will allow defining which population requires treatment, the time and place of the intervention, and the material and human resources available (Rodríguez, Davoli & Pérez, 2009) aiming, whenever possible, to meet the requirements of immediacy, proximity, simplicity and the expectative of a prompt recovery.

Based on the findings of the present study and on our clinical experience, we propose a number of recommendations:

- The most frequently identified source of stress among healthcare staff is the lack, and therefore the need of, information to maintain its professional competence. The information must meet the following characteristics: clear, accurate, trust worthy, reliable and timely. Following Macías (2009) recommendation the information must include the proper authorities, healthcare staff and general population. Strauss and collaborators (2004) consider that the paucity of information about the aetiology and transmission of the disease is an added difficulty during the outbreak. Maunder (2004) suggests that effective communication needs to take into account contextual factors that may influence the perception of risk.
- It is important that healthcare staff are able to express doubts and worries and trained personnel can respond to them promptly, providing clarifications to reduce symptoms in periods of acute stress.
- In a third-level hospital, it is important to identify healthcare staff with acute stress so that lower risk duties can be assigned to them to permit their adequate functioning. This measure protects the employee and reduces the risk of providing inadequate care to the patient.
- Implementation of an intervention service that specializes in mental health so that it can provide care to clinically significant cases, and to cases where the employee's psychological mechanisms are overwhelmed and this interferes with his or her work performance.
- Implementation of psychology intervention groups to make sense of post-traumatic stress, once the emergency has finished and in order to prevent chronicity of the condition and emotional difficulties, by means of analysing shared experiences and knowledge.
- To consider as a permanent and long-term strategy the formation of Balint groups, in order to promote mental health through early and timely treatment of the sources of stress, a strategy that has been previously reported and supported by the World Health Organization (World Health Organization, 2003). This procedure involves orientating the group to concentrate on three main areas: 1) an analysis of the emergency and a realistic attitude to manage the situation; 2) the duties of healthcare staff and their responsibility in dealing with the event; and 3) dealing with the inherent characteristics of the emergencies, and the physical, psychological and behavioural responses such as fears, uncertainty, disinformation, rumours,

denial and risk behaviours. This strategy has been reported to be effective in groups of medical interns (Carreño et al., 2010; Morales-Carmona, Carreño, Luque & Sánchez, 2009; Sandoval, Viladoms & Ponce de León, 1994).

- To follow the guidelines of psychological first aid and intervention in crises, with the support of clinical guidelines of psychological interventions during emergencies (World Health Organization, 2003).

As a way of conclusion, and taking into account the statements made by the WHO regarding the existence of a number of mutations in known viruses, in the following years, public health emergencies will be more frequent and the opportunity to use a multidisciplinary approach will be the alternative to face the emergencies. It is important to integrate mental health data to the national reports that have recorded the lessons learned in the light of Mexico's recent experiences, reports such as the National Plan for the training and response in case of an aggravation of stationary influenza or in response to an influenza pandemic, as well as the reports published by Macías and Sarti (Macías et al., 2009 and Sarti et al., 2009).

Finally, among the lessons learned, Macías (2009) argues that: "The strength of health institutions lies in their employees, which require treatment if in ill health and education to prevent autoinoculation through eyes, nose or mouth". To this we might add the importance that mental health has for the effective response of healthcare staff.

Psychologists in health settings need to contribute and provide plans of action to deal with emergency situations, fostering the perception of well-being among healthcare staff that will improve the care that is provided and the public safety programmes.

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