Exposure to war traumatic experiences, post-traumatic stress disorder and post-traumatic growth among nurses in Gaza

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Accessible summary

What is known on the subject?
- This study builds on existing research on war-related factors that may affect health-care staff by particularly focusing on trauma exposure in both professional and everyday life, as well as on correlates of later positive psychological changes.

What this paper adds to existing knowledge?
- It shows that one in five nursing staff working in Gaza experienced post-traumatic stress symptoms within the clinical range, 2 years after an incursion on Gaza and after being exposed to substantial trauma during this period.
- Participants appeared to develop a variety of post-traumatic growth responses following trauma exposure.
- Although nurses experienced traumatic events both as civilians and in their health-care capacity, personal exposure was strongly associated with PTSD symptoms.

What are the implications for practice?
- Support to nursing and other health-care professionals in war situations should entail different levels, remain available well after an acute conflict, and take into consideration both personal and practice-related traumatic events. Mental health nursing practitioners can play a pivotal role in this.

Abstract

Aim: To establish the association between war traumatic experiences, post-traumatic stress disorder (PTSD) symptoms and post-traumatic growth among nurses in the Gaza Strip, 2 years after an incursion on Gaza, and during a period of ongoing trauma exposure. This study builds on existing evidence by considering exposure to personal and work-related traumatic events, and on factors associated with later positive psychological adaptation.

Methods: The sample consisted of 274 randomly selected nurses in Gaza who completed the Gaza Traumatic Events Checklist, PTSD Checklist, and Posttraumatic Growth Inventory.

Results: Of the nurses, 19.7% reported full PTSD. There was a significant relationship between traumatic events and PTSD scores; as well as between community-related traumatic events and post-traumatic growth. Participants reported a range of traumatic events, but PTSD and post-traumatic growth scores were more strongly associated with community rather than work-related traumas.

Discussion: Nursing professionals experienced high levels of distress 2 years following an acute period of conflict, both as civilians and in their health-care capacity.

Implications for Practice: There is need for different levels of support for health-care staff in war-affected areas. Mental health nursing professionals have a central role in training, counselling and support to other health-care colleagues.
Introduction

The prevalence of post-traumatic stress disorder (PTSD) and its emotional correlates among frontline health and rescue workers have been widely investigated in recent years. Nursing professionals are at an increased risk for work-related stress, particularly in specialty areas such as intensive care, emergency and oncology units. Trauma exposure can be personal, professional, or a combination of the two. Therefore, it is not surprising that high PTSD rates have been reported among critical care nurses (Mealer et al. 2009). Czaja et al. (2011) reported that symptoms of PTSD are common in paediatric nurses due to repeated exposure to indirect traumatic experiences in the acute care setting, and also identified potential work factors that included feeling overextended, fear of causing an adverse event, and poor team interactions.

A survey of members of the US Emergency Nurses Association found that one out of ten emergency care nurses experienced physical violence over the consecutive 7-day period prior to completing the questionnaire. Of those that were assaulted, 17% experienced symptoms similar to PTSD within the 7-day period after the assault (Gates et al. 2011). In a systematic review of 28 studies of the worldwide current prevalence of PTSD in rescue workers, reporting on 40 samples with 20 424 rescuers, the worldwide pooled current prevalence was 10%. Studies of ambulance personnel found higher PTSD prevalence rates than studies with firefighters and police officers (Berger et al. 2012). The construct of PTSD in the nursing profession is often understood within the context of the Nurse as Wounded Healer theory. According to this theory and PTSD classification, essential symptoms consist of intrusion, avoidance, and hyperarousal (Conti-O’Hare 2012). Consequences include world view changes, retention issues, sleep disruption, and social network disturbances (Mealer & Jones 2013).

Resilience and post-traumatic growth (PG – denoting positive psychological changes following adversity to enable more adaptive functioning) theory and research are rooted in the philosophical stance that emphasizes the consideration of positive (salutogenic) rather than pathological or negative factors in trauma research (Tedeschi & Calhoun 2004). Although much research has focused on the negative consequences of trauma and on coping strategies to stressful life events such as loss or suffering, the possibilities for experiencing personal growth positive psychological changes following exposure to highly challenging life circumstances have received considerable attention since the 1990s. Pietrzak et al. (2010), in a study of 272 predominantly older reservist/national guard Operation Enquiring Freedom – Operation Iraqi Freedom (OEF-OIF) veterans, found that 72% of the sample endorsed a significant degree of post-traumatic growth in at least one of the areas assessed, the most common of which were changing priorities about what is important in life (52.2%), being able to better appreciate each day (51.1%), and being able to better handle difficulties (48.5%). Despite this interesting body of literature, there is still limited evidence on how working in areas of war and political conflict can impact on nursing and other health-care staff, i.e. the extent of personal and work-related trauma; and which types of personal growth they may develop in response. This was the rationale for this study.

Methods

Participants

The study was conducted after the 2009 war in Gaza (Ministry of Health 2009). After nearly 3 weeks of daily bombardment, air strikes and ground troop incursions, over 1340 Palestinians were killed and 5500 were injured in the Gaza Strip. Hundreds of homes were destroyed, and many more suffered damage. Internal displacement was high, with over 90 000 individuals affected. More than 40 000 Palestinians resided in United Nations for Relief and Work of Palestinian Refugees (UNRWA) shelters, while an estimated 50 000 resided with families and friends.

The nursing profession in Gaza has significantly increased in recent years, to almost 6000 practitioners (or ratio of 1 per 5000 population), of whom two-thirds are under the age of 37 years. There are comparatively more male, public sector and UN employed, but less non-government organisation-employed nurses in the Gaza Strip than in the West Bank, patterns which reflect the respective populations and services (Ministry of Health, 2009).

According to hospital type, 10% of nursing practitioners were selected from each hospital or other type of health setting in the Gaza Strip. In total, 274 nurses agreed to take part. These were selected from the Ministry of Health (216, 78.9%), Military Medical Services (14, 5.1%), the UNRWA (27, 9.8%), and from the private sector (17, 6.2%). More specifically, they worked at the European Hospital (27.5%), El Remal Center (5.9%), Shifa Hospital (33.0%), Awada Hospital (6.2%), Baslam Hospital (5.1%), Jabalıa Center (4.0%), Kamal Edwan Hospital (11.0%), and Ophthalmology Hospital (7.0%).

Mental health nurses were not included in the sample. The age of the participating sample ranged from 20 to 57 years, with a mean of 33.4 (SD = 8.93). There were 145 males (52.9%) and 129 females (47.1%). Regarding their qualifications, 79 (28.9%) were ‘practical’ nurses (2 years in Nursing college), 26 (9.5%) had a 3-year diploma in nursing, 160 (58.4%) had a bachelor’s degree in nursing
(4 years in Nursing college), and 9 (3.2%) had a masters degree. The participants’ monthly income ranged from less than US$240 (40, 14.6%), US$241-700 (101, 36.9%), 701-1000 (115, 41.9%), to more than $1000 (18, 6.6%). All participants were present in Gaza during the same period of the war.

Ethics approval was obtained from the Palestinian Ministry of Health Ethics Committee. Participants received an explanatory letter on the aims of the study and that the information gathered would remain confidential for the purpose of the research only. Data collection took place in the workplace, 2 years after the end of the 2009 war, i.e. in April 2011.

Measures

Gaza Traumatic Events Checklist (GTEC – Thabet et al. 2009): This described the most common traumatic experiences the population could have faced during the Gaza War. The checklist was revised from an earlier version (Thabet et al. 2004). The GTEC consists of 28 summated items with ‘Yes’ and ‘No’ answers. The scale had high internal consistency (α = 0.90).

Post-traumatic stress disorder checklist

Diagnostic and Statistical Manual-Fourth Edition (DSM-IV), Arabic version of Posttraumatic Stress Disorder Checklist (PTSDC – Thabet et al. 2008): The PTSDC includes 17 items of post-traumatic stress symptoms adapted from the DSM-IV criteria (American Psychiatric Association 1994). Respondents were asked to rate on a 5-point Likert scale (0 = not at all to 4 = extremely) the extent to which symptoms troubled them in the previous month. A total summated score was provided, as well as subscales scores for intrusion, arousal, and avoidance PTSD symptoms. We used the Arabic version of the scale, which has been widely used in the region during the last decade (Thabet et al. 2008). In this study, this measure was also found to have high internal consistency (α = 0.91).

Posttraumatic Growth Inventory

Posttraumatic Growth Inventory (PTGI – Tedeschi & Calhoun 1996): This comprises 21 summated items of personal growth after exposure to trauma, with response choices during the previous month, ranging from 0 = not experience this change, to 4 = I experienced this change to a great degree. The PTGI measures five domains of growth: (1) relating to others better (seven items); (2) recognizing new possibilities (five items); (3) a greater sense of personal strength (four items); (4) spiritual change (two items); and (5) greater appreciation of life (three items). The items were summed, with higher scores indicating higher personal growth across the different domains. The measure was translated and back translated by a panel of experts in the mental health field. It was also found to have high internal consistency (α = 0.94). This was not subjected to a factor analysis, but it was piloted with nursing 35 employees prior to the study, following which the phrasing of only one item was amended. These 35 pilot participants were excluded from the main study.

Statistical analysis

Data were entered and analysed using the Statistical Package for Social Sciences (SPSS) software version 20. Between-group comparison was explored by independent t-test, while the associations between different continuous variables were tested by Pearson correlation coefficient. Regression models were conducted, in which trauma scores were entered as the independent variable, and either PTSD or post-traumatic growth scores entered as the dependent variables. Values were considered statistically significant if P was lower than 0.05.

Results

Exposure to trauma

The highest frequencies of reported traumatic events were: 94.1% had watched severe injuries and dead bodies on TV, 78.4% witnessed severe injuries and death at work, and 63.5% witnessed demolishing of neighbours’ homes by tanks. We then recoded traumatic events to personal trauma (due to war), indirect work trauma (in the community, due to their health profession), and direct work trauma (at the workplace, usually emergency rooms). The mean total traumatic events were 7.5 (SD = 3.7), mean personal trauma 3.6 (SD = 1.9), mean indirect work trauma 2.2 (SD = 1.8), and mean direct work trauma 1.7 (SD = 1.1).

Potential gender and/or income differences were tested, as these might have reflected professional or personal trends in exposure to trauma in the working environment or in the community. Independent t-test showed statistically significant gender differences, with male nurses having experienced significantly more traumatic events than females across all trauma categories: total trauma for males (M = 8.40, SD = 3.85) and for females (M = 6.43, SD = 3.40) (t (271) = 4.47, P = 0.001), personal trauma for males (M = 2.36, SD = 1.92) and for females (M = 1.94, SD = 1.68) (t (271) = 4.01, P = 0.001), indirect work trauma for males (M = 4.03, SD = 2.09) and for females (M = 3.09, SD = 1.72) (t (271) = 1.93, P = 0.05), and direct work trauma for males (M = 2.36, SD = 1.92) and for females (M = 1.94, SD = 1.68) (t (271) = 4.93, P = 0.001).
A one-way ANOVA showed that the nurses with highest monthly income (more than US $1000) had a significant less traumatic events, $F(2, 267) = 5.04, P = 0.002$. Post-hoc analysis using Tukey’s Honesty Significant Difference (HSD) criterion indicated that mean scores of nurses with highest monthly income (more than US $1000) ($M = 10.72$, $SD = 4.23$) was significantly different from nurses with monthly income (US $650–999$) ($Mean = 7.34$, $SD = 3.46$), from nurses with monthly income (US $400–649$) ($Mean = 7.16$, $SD = 3.96$), and from nurses with monthly income (less than US $400$) ($Mean = 7.2$, $SD = 3.23$).

Post-traumatic stress disorder symptoms

Using DSM-IV criteria for the diagnosis of PTSD (one re-experiencing, three avoidance, and two hyperarousal symptoms), 54 nurses (19.7%) were rated as suffering from PTSD. Females reported significantly more total PTSD than males ($M = 20.67$, $SD = 12.72$) and for females ($M = 24.67$, $SD = 11.91$), $t(232) = 234$, $P = 0.02$] and intrusion symptoms, total intrusion symptoms for males ($M = 7.34$, $SD = 4.32$) and for females [$M = 8.70$, $SD = 4.36$; $t(265) = 2.56$, $P = 0.01$].

The Pearson correlation test showed that there was a positive association between total trauma exposure and total PTSD ($r = 0.26$, $P < 0.001$), intrusion ($r = 0.32$, $P < 0.001$), avoidance ($r = 0.21$, $P < 0.001$), and hyperarousal symptoms ($r = 0.18$, $P < 0.001$).

In a multivariate regression model, each traumatic event was entered as an independent variable, with total PTSD scores as the dependent variable. Five traumatic events were significantly associated with total PTSD symptoms: witnessing killing of a friend or relative while at work ($B = 0.17$, $P = 0.004$); witnessing a friend’s home demolition ($B = 0.15$, $P = 0.01$); deprivation of going to the toilet or leaving the room while at home because of firing and shelling in the area ($B = 0.12$, $P = 0.04$); beating and humiliation by the army ($B = 0.18$, $P = 0.004$); and being threatened of death by being used as a human shield by the army ($B = 0.13$, $P = 0.03$) (Table 1).

The role of post-traumatic growth

There were no gender differences on any post-traumatic growth variables. Participants on the highest income reported significantly higher scores on relating to others than those on the lowest income ($F = 4.36$, $P = 0.04$). A Pearson correlation test between trauma and post-traumatic growth, as well as its subscales was conducted (Table 2). There were positive associations between total traumatic events and total post-traumatic growth ($r = 0.26$, $P < 0.001$), spiritual change ($r = 0.32$, $P < 0.001$), relating to others ($r = 0.21$, $P = 0.001$), personal strength ($r = 0.18$, $P < 0.001$), appreciation of life ($r = 0.18$, $P < 0.001$).

In a multivariate regression model, each traumatic event was entered as an independent variable, with total PTG scores as the dependent variable. Two traumatic events were significantly associated with total post-traumatic growth: witnessing firing by tanks and heavy artillery at

| Table 1 | Multivariate regression model between traumatic events and total post-traumatic stress disorder scores |
| Unstandardized Coefficients | Unstandardized Coefficients |
| B | Significance | 95.0% Confidence Interval |
| Lower Bound | Upper Bound |
| --- | --- | --- | --- | --- |
| Witnessing killing of a friend or relative while you are at work | 4.77 | 0.001 | 1.54 | 7.99 |
| Witnessing of a friend home demolition | 3.81 | 0.01 | 0.76 | 6.85 |
| Deprivation from water or electricity during detention at home | 3.56 | 0.05 | 0.02 | 7.10 |
| Beating and humiliation by the army | 5.12 | 0.001 | 8.54 | 1.69 |
| Threatened to death by being used as human shield to arrest your neighbours by the army | 4.85 | 0.03 | 0.40 | 9.31 |

| Table 2 | Pearson correlation coefficient between exposure to total traumatic events and post traumatic growth (total and subscales) scores |
| --- | --- | --- | --- | --- | --- | --- |
| 1. Total trauma | 1.00 ** | 1.00 ** | 1.00 ** | 1.00 ** | 1.00 ** | 1.00 ** |
| 2. Post traumatic growth | 0.24 ** | 0.10 ** | 0.10 ** | 0.10 ** | 0.10 ** | 0.10 ** |
| 3. Spiritual change | 0.20 ** | 0.07 ** | 0.07 ** | 0.07 ** | 0.07 ** | 0.07 ** |
| 4. Relating to others | 0.48 ** | 0.73 ** | 0.53 ** | 1.00 ** | 1.00 ** | 1.00 ** |
| 5. Personal strength | 0.25 ** | 0.94 ** | 0.74 ** | 0.64 ** | 1.00 ** | 1.00 ** |
| 6. Appreciation of life | 0.25 ** | 0.77 ** | 0.50 ** | 0.46 ** | 0.62 ** | 1.00 ** |
| 7. New possibilities | 0.21 ** | 0.91 ** | 0.55 ** | 0.55 ** | 0.80 ** | 0.68 ** |

**Correlation is significant at the 0.01 level two tailed.
neighbours’ homes (B = 0.21, P = 0.002); and witnessing killing of a friend (B = 0.15, P = 0.02), i.e. no work-related events predicted personal growth (Table 3).

A Pearson correlation coefficient test between total PTSD symptoms and post-traumatic growth scores (also total and subscales) was also conducted (Table 4). The results showed that there were positive associations between total PTSD and post-traumatic growth scores (r = 0.18, P < 0.001), personal strength (r = 0.13, P < 0.001), appreciation of life (r = 0.34, P < 0.001), and new possibilities (r = 0.18, P < 0.001).

Table 3
Multivariate regression model between traumatic events and total post-traumatic growth scores

<table>
<thead>
<tr>
<th>Traumatic event</th>
<th>Unstandardized coefficients (B)</th>
<th>Significance</th>
<th>95.0% confidence interval for B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Witnessing firing by tanks and heavy artillery at neighbours’ homes</td>
<td>7.44</td>
<td>.00</td>
<td>2.74 - 12.15</td>
</tr>
<tr>
<td>Witnessing killing of a friend</td>
<td>5.91</td>
<td>.03</td>
<td>0.71 - 11.10</td>
</tr>
</tbody>
</table>

Table 4
Pearson correlation coefficient between post-traumatic stress disorder symptoms and post-traumatic growth (total and subscales) scores

<table>
<thead>
<tr>
<th>Post-traumatic stress disorder inventory</th>
<th>Spiritual change</th>
<th>Relating to others</th>
<th>Personal strength</th>
<th>Appreciation of life</th>
<th>New possibilities</th>
</tr>
</thead>
<tbody>
<tr>
<td>PTSD</td>
<td>.18**</td>
<td>0.1</td>
<td>0.09</td>
<td>.13**</td>
<td>.34**</td>
</tr>
<tr>
<td>Intrusion</td>
<td>.25**</td>
<td>.21**</td>
<td>.16*</td>
<td>.20**</td>
<td>.33**</td>
</tr>
<tr>
<td>Avoidance</td>
<td>.15*</td>
<td>.05</td>
<td>.08</td>
<td>.11</td>
<td>.30**</td>
</tr>
<tr>
<td>Hyperarousal</td>
<td>.07</td>
<td>.04</td>
<td>.01</td>
<td>.02</td>
<td>.21**</td>
</tr>
</tbody>
</table>

*Correlation is significant at the 0.05 level two tailed. **Correlation is significant at the 0.01 level two tailed.

Discuss

The aim of this study was to investigate the effect of trauma due to war on Gaza on both PTSD symptoms and post-traumatic growth among Palestinian nurses in the Gaza Strip, who had been exposed to a range of traumatic events in the community (both as civilians and in relation to their professional role) and their health (usually hospital) setting. Its main contribution was thus consideration of both personal and work-related trauma in understanding this association. Participants commonly reported watching pictures of dead and injured people on TV, witnessing dead and injured people at emergency hospital rooms, and witnessing demolition of neighbours’ home by tanks. Such findings were consistent with most of studies conducted previously in the area with ambulance drivers (Abu Laila et al. 2009) and the general population (Thabet et al. 2008, 2009). Our study showed that males were more exposed to all types of traumatic events, in the community as well as the work place, which possibly reflects the sociocultural of protecting females, even in their professional capacity. The income differentiation may indicate higher trauma exposure for those living in more deprived areas, and/or lower grading and seniority among frontline staff.

The prevalence rate of 19.7% of PTSD among nursing staff was higher than other at risk groups such as 9–10% by assaulted psychiatric staff members (Chen et al. 2008). Gender differences were, in contrast, consistent with the PTSD literature in female nurses reporting significantly more PTSD and intrusion symptoms than males. Epidemiological studies have revealed gender-specific risk for PTSD development, such as that females are approximately twice as likely as males to develop PTSD following exposure to a traumatic event (Breslau et al. 1998, Chung & Breslau 2008). What is striking is that these high rates of one in five staff reporting significant levels of distress were detected 2 years after the termination of the particular period of conflict, although trauma exposure continued in other forms during this period.

The study showed that there was a significant relationship between traumatic events, PTSD and post-traumatic growth, which is also consistent with previous research (Pietrzak et al. 2010). Post-traumatic growth and positive changes often co-occur with PTSD (Lowe et al. 2013), and include improved interpersonal relationships, a greater sense of new possibilities, increased personal strength, heightened spirituality, and an enhanced appreciation of life. Recent studies suggest that upwards of 50% of survivors of natural disasters experience some degree of post-traumatic growth (Tang 2006, Yu et al. 2010, Xu & Liao 2011). What was particularly interesting in this study was that all traumatic events which were significantly associated with PTSD and/or post-traumatic growth were in the context of the participants’ personal and civilian experience rather than through their work environment. The only work-related trauma also referred to witnessing the killing of a friend or relative.
Irrespective of the specific mechanisms involved, these findings highlight the need for prolonged availability of staff support in the face of ongoing conflict, even if the acute phase is over. Such support could be provided at different levels throughout the healing process, both as health-care professionals and community members. These levels could include training and psycho-education, stress management, and more specialist therapeutic approaches, as required; as well as their evaluation to develop an evidence-based setting up counselling centres in health setting hubs in highly exposed areas could be a cost-effective way of making help systematically available to a large number of staff. This should include international visiting health staff, as in the more recent crisis in Gaza, particularly as nursing and medical volunteers will face high levels of trauma exposure both in the community and health settings (Shamia et al. 2014). Mental health nursing professionals have a pivotal role in this model, notwithstanding an acknowledgment of their own needs, both in their civilian and therapeutic capacity.

Limitations

The current design did not enable the understanding of factors and underpinning mechanisms that may have influenced post-traumatic growth, other than most of its subscales being strongly associated with both trauma exposure and post-traumatic symptoms. Previous studies have indicated positive associations between PTG and religiosity, as measured by the importance of religion and/or religious participation (Shaw et al. 2005, Helgeson et al. 2006). This is plausible in the sociocultural context of the sample (Milam et al. 2004). Although spiritual change was not the only significant factor involved, there appeared to be similar patterns across other post-traumatic growth factors. As a meta-analysis by Prati & Pietrantoni (2009) showed, factors such as optimism, social support, and coping strategies (of which religiosity is one of several) can also contribute to post-traumatic growth. Another limitation was not being able to disentangle the effect of the particular period of conflict from the ongoing violence in the region.

References

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