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Social network as a moderator in the relation between trauma exposure and trauma reaction: A survey among UN soldiers and relief workers

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Social network as a moderator between trauma exposure and post-trauma symptomatology was studied. Two samples – relief workers and UN soldiers – were assessed on trauma exposure, social network and three dependent measures related to post-trauma reactions. Regression analysis and interaction plots were used to determine the presence of interaction effects between trauma exposure and social network. All four network variables moderated the relationship between trauma exposure and post-trauma reactions among relief workers, while among UN soldiers only two such buffer effects were found. Furthermore, among UN soldiers one of these interaction effects was reversed, indicating social support to be important for those low on trauma exposure, while among relief workers support was important in the high-exposure condition. The results indicate a difference with respect to the importance of social network as a moderator between groups exposed to different kinds of war trauma. Differences in motivational systems may also exist. However, further research will have to establish this.

Key words: War trauma exposure, post-traumatic reactions, social network support, UN soldiers, relief workers, moderator effect.

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Traumatic experiences have, to varying degrees, proven to be related to later onset of post-traumatic stress disorder (PTSD). In addition, PTSD rates vary in both trauma and community samples (Davidson & Fairbank, 1993). Among war veterans this variability is especially high. In 35 studies on war veterans, prevalence rates varied between 2% and 70% (McFarlane & de Girolamo, 1996). Such divergence in prevalence rates is probably caused by a number of factors. Six of 11 studies on PTSD prevalence among prisoners of war found it to be 50% or more (van der Kolk, 1996) and in three of these studies the prevalence rate was more than 70%. Such findings suggest that stressor characteristics alone cannot explain trauma-related responses, although aspects of the trauma are obviously important (March, 1993). Because variability with respect to prevalence is especially high among war veterans, it is reasonable to expect certain inherent characteristics of the traumatic experience as well as various factors of resilience and vulnerability to influence the processes that are operative between trauma exposure and trauma reactions.

Various factors have been postulated to moderate and mediate the relation between traumatic stress and symptoms. Among these are personality characteristics and various social dimensions (McCarrol, Fullerton & Ursana, 1997). Personality dimensions have been appointed as especially important to the development to PTSD. Clark, Watson and Mineka (1994) pointed out that personality could affect individual vulnerability to PTSD as well as the expression of PTSD (i.e. a moderator effect). Personality dimensions, such as attributional style (Yule, 2000), locus of control (Frye & Stockton, 1982; Solomon, Miculincer & Benbenishty, 1989) and sensation seeking (Neria, Solomon, Ginzburg & Dekel, 2000; Solomon, Ginzburg, Neria & Ohry, 1995), have been implicated in PTSD development. Buffer effects of social support have also been demonstrated in war-related stress (Hobfoll & London, 1988), in depression (Pengilly & Dowd, 2000), with respect to anger among PTSD-afflicted prisoners (Schützwohl & Maercker, 2000) and with respect to cravings among substance-dependent individuals (Ames & Roitzsch, 2000). Solomon and Miculincer (1990) furthermore found that the effect of life events on the development of PTSD is indirect and works through social network.

Several studies indicate the importance of social support after trauma. Keane, Scott, Chavoya, Lamparski & Fairbank (1985) showed that social network had a tendency to decline over time among Vietnam soldiers as compared with controls. This may agree with the supposition that social network and social support systems may become "worn out" after severe trauma, and so decline. It may also suggest that war-traumatized individuals suffer from major adjustment problems. However, the impact of social support as a buffer and independent predictor have also been demonstrated. Joseph, Williams and Yule (1992) demonstrated that crisis support predicted lower intrusion and avoidance symptoms among PTSD diagnosed individuals over and above attributional style and coping style. Furthermore, Perry, Difede, Musngi, Frances & Jacobsberg (1992) demonstrated the importance of perceived social support after burn injury, thus indicating the importance of perceived social support as distinguished from actually received support. Based on these findings, it is reasonable to conclude that stressor

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characteristics, personality variables and aspects within the social environment are all important influences on the relationship between trauma and trauma reactions.

Various kinds of social support have been suggested to intervene between traumatic events and trauma reactions. Models of adaptation have, however, generally not included social support. According to Yule (2000), social support is probably a potent explanatory factor in the cause-and-effect relationship between trauma exposure and reactions, and as such should be included in an adaptational model. Joseph, Williams and Yule (1995) point to the fact that the seeking of social support is an important coping behavior in response to stress. Furthermore, knowledge of different kinds of social support and how they relate to outcome measures may be of great clinical value. However, our theoretical understanding of social support is not good (Yule, 2000). The distinction has been made between perceived (structural) support and crisis (functional) support. Perceived social support is support that is being perceived as available by the person, whereas crisis support is actually received support. It is thus reasonable to view perceived support as accessible social network, and crisis support as actually received support. In this study we are concerned with a measure of perceived available social network (functional network) and a linear measure of war trauma exposure. Because trauma-related reactions are not restricted to PTSD (Mueser *et al.*, 1998) and because PTSD sufferers constitute only about 10% of the traumatized population (Brom, Kleber & Hofman, 1983), this article is concerned with general trauma reactions rather than clinically diagnosed PTSD.

Different kinds of social support have been proposed to exert different effects according to the type of event it is supposed to moderate or mediate (stressor–support specificity model). Practical support has been found to exert the most desired effects in relation to controllable events (Yule, 2000). Kobasa and Puccetti (1982) found that a measure of social support was effective only if the person was perceived to be in control of the situation. A similar result was found by Bartone, Ursano, Wright and Ingraham (1989). They found that those high on social support and low on hardiness (a measure that assesses commitment, control and challenge) exhibited most symptoms. This suggests that social support may exhibit interaction effects with certain variables, thus exerting a stress-buffering effect on the relation between trauma exposure and trauma response. However, there is still controversy as to whether the effects of social support are entirely positive, or whether there can also be negative effects (Skogstad, 2000).

Cobb (1976) demonstrated moderator effects of social support on various forms of life stress. The possible role of social support as a moderator in the cause-and-effect relationship between trauma exposure and trauma reaction has, however, not been extensively investigated in the literature. Matthey, Silove, Barnett, Fitzgerald and Mitchell (1999), in studying 31 pregnant women, found no buffer effect for social network on the relation between previous traumas and psychological morbidity (among them post-traumatic stress reactions) following birth among these women. However, Stretch, Vail and Maloney (1985) found social support to be important in moderating the attenuation of PTSD among Vietnam war veterans. Furthermore, King, King, Keane, Fairbank and Adams (1998) found evidence for mediation effects on the trauma–PTSD relation, but only minimal moderation effects. Social support may thus have both direct effects on the trauma–stress relationship (as earlier mentioned) as well as indirect stress-buffer effects.

Differential effects of available versus actually received support as well as differential effects of support (both received and actual) from different social relations have, to our knowledge, not been investigated in the literature. Overstreet, Dempsey, Graham and Moely (1999) found that availability of family support moderated the effect of exposure to violence on depressive symptoms. However, such support did not moderate the relation between exposure to violence on post-traumatic symptoms in low-income African-American children, suggesting that the role of social support from different social network relations on various trauma reactions is still a matter of controversy.

The present paper explores the following questions. First, will social network, measured as availability of family, friends, neighbors and colleagues, moderate the relationship between trauma and trauma reactions among relief workers and UN soldiers who have served in the former Yugoslavia? Second, are there any differences between UN soldiers and relief workers pertaining to these possible effects? Third, is there any network relation that is more important in this respect? Fourth, is there any group difference with respect to predictive power of network variables?

METHODS

Subjects

Two different samples participated in the study. These were the only two samples available in the study material. Sample 1 consisted of 302 relief workers (RW) who participated in aid services in Yugoslavia from 1992 to 1996. Data were collected during 1996. This sample was given a set of questionnaires, most of which were standardized. A total of 141 persons participated (46.7%; age range 26–66 years, mean = 42.8 years).

Sample 2 (UN) comprised every Norwegian United Nations military observer (UNMO) who had served in the former Yugoslavia. These were given the same set of questionnaires as the relief workers. All military divisions (army, navy and air force) were represented, and, out of a total of 97, 72 persons returned the questionnaires (74.2%; age range 32–54 years, mean = 44.1 years). Duration of service (both groups taken together) ranged from 1 to 37 months (mean = 10.4 months).

In sample 1, 85.1% of the participants were men, and in sample 2 only nine persons (12.5%) were women. Gender is therefore not treated as a variable in this study. Due to the low percentage of respondents in sample 1, a frequency test was performed on working categories, in order to ensure that this sample was not biased in

any direction. This test revealed that 12.8% were out of work, and the rest of the participants were distributed between six different work categories in the following way: blue collar 17.0%, blue collar professional 18.4%, white collar 9.9%, white collar professional 18.4%, managerial position 19.1%, and independent occupations 15.6%. Although these categories cannot mitigate the distorted sample distributions, they may give some indication that the sample is not biased.

Instruments

Trauma exposure (TE). A measure of trauma exposure consisting of eight items was used. This questionnaire was based on the one used in the United Nations Interim Force In Lebanon (UNIFIL) study (Weisaeth, 1993). The questionnaire taps information on war-related experiences and events witnessed by the individual. It also taps information on traumatic experiences perceived as directed against oneself, in addition to experiences that have been witnessed as directed against others. The following questions were included: (1) "During your stay, were you exposed to the sight of dead people, brought about by acts of war (mines, battle, shells etc.)?" (2) "Were you threatened by weapons during your service?" (3) "Were you (or anybody in your division) at any point of time held in captivity by any of the parties (prisoner, hostage, etc.)?" (4) "Were you during your service humiliated or offended by any of the parties?" (5) "Did you witness harassment against civilians?" (6) "Were you ever involved in trying to spare civilians against harassment?" (7) "Were you ever afraid of being hurt or losing your life during the service?" (8) "Were you during the service involved in work with dead or severely hurt people?" Internal consistency as measured by Cronbach's α was 0.71. In order to obtain interaction plots, this trauma measure was divided into high and low trauma exposure based on the median. The trauma exposure was also, based on the DSM-IV criteria, divided into violence against others (questions number 1, 5, 6 and 8) and violence directed against oneself (questions number 2, 3, 4 and 7).

Social network support (SNS). A measure consisting of seven questions tapping information on general social network support was used. These questions enquired about the relationships with family, friends, neighbors and colleagues. The questions were posed as follows: To what degree do you/can you: "feel worthy", "talk about what is important", "feel appreciated", "feel useful", "feel common interests with", "feel lonely" and "get help and support from" in relation to the following persons: family, friends, neighbors and colleagues. The questions were rated from one to five, with one being "not at all" and five being "to a high degree". Four scales were constructed, each consisting of six items. One item (item number six: "To what degree do you feel lonely relative to the following persons") was excluded due to low inter-item correlations. In order to obtain interaction plots, responses on each of these scales were divided into high versus low support measures based on the median. Reliability analysis revealed the following measures on internal consistency: family (Cronbach's $\alpha = 0.89$, UN soldiers, and $\alpha = 0.89$, relief workers), friends (Cronbach's $\alpha = 0.90$, UN soldiers, and $\alpha = 0.90$, relief workers), neighbors (Cronbach's $\alpha = 0.93$, UN soldiers, and $\alpha = 0.91$, relief workers) and work colleagues (Cronbach's $\alpha = 0.90$, UN soldiers, and $\alpha = 0.89$, relief workers).

Post-traumatic Stress Scale (PTSS). The PTSS-10 (Holen, Sund & Weisaeth, 1983) is a 10-item scale measuring post-traumatic stress symptoms of a general kind. The measure has good reliability characteristics. The scale exists in two versions, one short and one standard. In the standard version, the responses are graded from zero to seven, and in the short version the respondents simply check off whether the symptoms are present or not. The standard version of this scale was used among the relief workers and the short version among the UN soldiers. In order to be able to compare means between the groups with respect to the PTSS scale, the symptom scale was recoded into the dichotomized version for relief workers. Reliability tests revealed a Cronbach's $\alpha = 0.90$ among relief workers and 0.84 in the UN sample.

Impact of Event Scale (IES). The IES (Horowitz, Wilner & Alvarez, 1979) is a 15-item measure designed to tap subjective event-related stress. It consists of two subscales that tap trauma-related intrusive and avoidance symptoms. The IES has good reliability characteristics. In the present sample, Cronbach's α for the total IES score was 0.92. Reliability for the intrusion measure was $\alpha = 0.88$ among the UN soldiers and 0.89 among the relief workers. The IES avoidance measure revealed a Crohnbach's $\alpha = 0.82$ among UN soldiers and $\alpha = 0.84$ among relief workers. The two sub-measures were significantly correlated ($r = 0.70$; $p < 0.01$). However, the two measures were treated separately, as is customary in PTSD research. They also give differential information.

Statistics

Moderator effect. Moderator effects were tested by means of hierarchical regression analyses. Analyses were performed in three steps. In the first step trauma exposure was entered, in the second step the network variable, and in the third step the interaction term. This was to ensure that main effects and the interaction term were partialed out and provide unique variance contributions (Jaccard, Turrisi & Wan, 1990). Distributional properties were examined, and all residuals on dependent measures were found to be normally distributed. Separate analyses were performed for each of the four network categories and for each dependent measure.

Interaction plot. In order to clarify the direction of the interaction effects, dichotomized versions of the trauma exposure and network measures were plotted against mean values of the dependent variables. The dichotomized versions were based on the median.

RESULTS

Preliminary analyses

Demographic data for the two samples is shown in Table 1. Means and standard deviations on the dependent and independent measures by group are presented in Table 2. The *t*-tests revealed a group difference between UN soldiers and relief workers for the three dependent measures as well

Table 1. *Demographic data*

Variables	Relief workers	UN soldiers
Mean (*SD*) age (years)	42.1 (8.3)	44.1 (5.7)
Gender (%)		
Men	85.1	87.5
Women	14.9	12.5
Marital status: *n* (%)		
Single	28 (19.9)	9 (12.5)
Married/co-habitee	88 (62.4)	57 (79.2)
Separated/divorced	25 (3.5)	6 (8.3)

Table 2. *Means and standard deviations on dependent and independent measures*

Variable	Relief workers			UN soldiers			Difference in mean
	n	*M*	*SD*	*n*	*M*	*SD*	
Dependent							
PTSS	134	4.11	3.03	72	1.13	1.99	2.98***
IES (intrusion)	135	6.52	6.86	71	12.42	7.94	5.90***
IES (avoidance)	127	4.26	6.12	67	6.85	6.62	2.59**
Independent							
Trauma exposure	138	1.70	0.45	70	2.64	0.46	0.94***
Family support (FaS)	137	4.62	0.55	71	4.62	0.46	0.00 n.s.
Friends support (FrS)	136	4.47	0.56	70	4.25	0.66	0.22*
Neighbor support (NS)	129	3.40	0.94	68	3.18	0.98	0.22 n.s.
Colleague support (CS)	128	4.15	0.72	71	3.87	0.75	0.28**

***$p < 0.001$; **$p < 0.01$; *$p < 0.05$.

as the measure on trauma exposure (see Table 2). Relief workers reported more PTSS symptoms than did UN soldiers, while UN soldiers were significantly higher on avoidance and intrusion. Furthermore, UN soldiers reported less support from friends ($M = 4.25$) than did relief workers (4.47, $p < 0.05$). UN soldiers also reported less colleague support (3.87) than did relief workers (4.15, $p < 0.01$). However, there were no differences in family support between UN soldiers (4.64) and relief workers (4.62). Neither was there any difference in support from neighbors between UN soldiers (3.18) and relief workers (3.40) (see Table 2).

Regression analyses

Trauma exposure seems to be a statistically significant predictor of all symptom variables among relief workers (Table 3). Among UN soldiers, however, PTSS symptoms were not predicted by trauma exposure.

The predictive power of the four network variables on the relation between trauma exposure and stress symptoms is presented in Table 3. These results reveal that, for the UN soldiers, six out of 12 variables on social network exert a significant direct influence on symptoms. Colleagues seem to

Table 3. *Predictive power of trauma exposure and social network among UN soldiers and relief workers*

Variable	Relief workers				UN soldiers			
	B	*SE B*	β	R^2	*B*	*SE B*	β	R^2
Trauma exposure (TE)								
PTSS	5.73	1.35	0.35***	0.12	0.85	0.51	0.02	0.04
Intrusion	4.58	1.24	0.31***	0.10	4.74	2.06	0.27*	0.07
Avoidance	5.63	1.07	0.43***	0.19	4.96	1.63	0.36**	0.13
Social network								
Family								
PTSS	−4.62	1.11	−0.35***	0.12	−1.15	0.41	−0.32**	0.10
Intrusion	−1.43	1.13	−0.11	0.01	−1.82	1.70	−0.13	0.02
Avoidance	−2.54	1.00	−0.22*	0.05	−2.28	1.63	−0.17	0.03
Friends								
PTSS	−4.48	1.06	−0.35***	0.12	−0.80	0.35	−0.26*	0.07
Intrusion	−1.20	1.06	−0.10	0.01	−4.20	1.37	−0.35**	0.12
Avoidance	−3.23	0.94	−0.30***	0.09	−1.92	1.32	−0.18	0.03
Neighbors								
PTSS	−2.69	0.68	−0.34***	0.11	−0.46	0.25	−0.22	0.05
Intrusion	−5.58	0.65	−0.08	0.01	−1.44	0.99	−0.18	0.03
Avoidance	−0.65	0.60	−0.10	0.01	−1.22	0.08	−1.18	0.03
Colleagues								
PTSS	−4.64	0.85	−0.45***	0.20	−1.44	0.27	−0.54***	0.29
Intrusion	−2.51	0.83	−0.26**	0.07	−5.36	1.09	−0.51***	0.26
Avoidance	−2.93	0.74	−0.35***	0.12	−3.51	1.05	−0.39***	0.15

Note: Three analyses have been run. All predictors were put in one regression analysis with each dependent variable.
*$p < 0.05$; **$p < 0.01$; ***$p < 0.001$.

Table 4. *Hierarchical regression analysis: social network as predictor of trauma reaction(t) among relief workers*

Variable	*B*	*SE B*	β	R^2	ΔR^2
PTSS					
Step 1: T	5.79	1.38	0.35***	0.12***	
Step 2: Family	−3.89	1.08	−0.29***	0.21***	0.09
Step 3: T × Family	−10.44	2.19	−3.02***	0.33***	0.12
Step 1: T	5.68	1.39	0.34***	0.12***	
Step 2: Friends	−3.77	1.05	−0.29***	0.20***	0.08
Step 3: T × Friends	−11.70	1.78	−3.38***	0.41***	0.21
Step 1: T	5.95	1.40	0.36***	0.13***	
Step 2: Neighbors	−2.33	0.66	−0.29***	0.21***	0.08
Step 3: T × Neighbors	−5.15	1.04	−0.85***	0.29***	0.08
Step 1: T	5.96	1.53	0.34***	0.11***	
Step 2: Colleagues	−4.33	0.84	−0.40***	0.28***	0.17
Step 3: T × Colleagues	−8.71	1.05	−0.90***	0.43***	0.15
IES intrusion					
Step 1: T	0.69	0.18	0.31***	0.10***	
Step 2: Family	−0.13	0.15	−0.07	0.10	0.00
Step 3: T × Family	−1.16	0.36	−2.58***	0.17***	0.07
Step 1: T	0.67	0.18	0.32	0.10***	
Step 2: Friends	−0.11	0.15	−0.06	0.10	0.00
Step 3: T × Friends	−1.06	0.28	−0.234	0.19	0.09
Step 1: T	0.63	0.18	0.31***	0.10	
Step 2: Neighbors	0.00	0.09	−0.09	0.11	0.01
Step 3: T × Neighbors	−0.24	0.20	−0.67	0.12	0.01
Step 1: T	0.61	0.19	0.27**	0.07	
Step 2: Colleagues	−0.37	0.11	−0.28***	0.15	0.08
Step 3: T × Colleagues	−0.49	0.18	−0.90*	0.18	0.03
IES avoidance					
Step 1: T	0.69	0.14	0.42***	0.18***	
Step 2: Family	−0.22	0.11	−0.17*	0.21*	0.03
Step 3: T × Family	−1.11	0.25	−2.21***	0.32**	0.11
Step 1: T	0.710	0.14	0.43***	0.19***	
Step 2: Friends	−3.10	0.11	−0.24**	0.24**	0.05
Step 3: T × Friends	−0.97	0.20	−2.81***	0.37***	0.13
Step 1: T	0.67	0.14	0.42***	0.18***	
Step 2: Neighbors	−0.01	0.06	−0.09***	0.19	0.01
Step 3: T × Neighbors	−0.37	0.11	−0.80***	0.23	0.04
Step 1: T	0.73	0.15	0.42***	0.18***	
Step 2: Colleagues	−0.32	0.08	−0.31***	0.27***	0.09
Step 3: T × Colleagues	−0.60	0.10	−0.75***	0.35***	0.08

***$p < 0.001$; **$p < 0.01$; *$p < 0.05$.

be an important group among UN soldiers with respect to direct influence. Neighbors did not exert any statistically significant influence with respect to any of the dependent measures among UN soldiers, and family was found to be important with respect only to PTSS symptoms.

Results on social network as a moderator for post-trauma symptoms among relief workers are presented in Table 4. As regards UN soldiers, only the colleague index had a statistically significant effect on post-traumatic symptoms ($B = -1.57$; $SE\ B = 0.59$; $\beta = -1.95$; $p < 0.01$). Furthermore, friends came out statistically significant as a moderator on the relation between trauma exposure and intrusion symptoms ($B = 8.14$; $SE\ B = 2.95$; $\beta = 2.50$; $p < 0.01$). There were no significant moderator effects of social network on the relations between trauma exposure and avoidance symptoms among UN soldiers.

Interaction plots

Interaction plots for the relation between trauma exposure, family support and PTSS symptoms and the relation between trauma exposure, family support and IES measures for relief workers are presented in Fig. 1a–c. For comparison, Fig. 1d shows the interaction plot for the relation between trauma exposure, support from friends and IES intrusion, for the UN soldiers.

The interaction plots reveal that there is a group difference between UN soldiers and relief workers with respect to the interactive effect of trauma exposure and network support on PTSD-related symptoms. Social network tends to reduce symptoms among relief workers in the high-exposure condition, while such support tends to reduce symptoms in the low-exposure condition among UN soldiers.

Those regression analyses that produced significant interaction effects also produced clear interaction plots. Four of these plots are included for the purpose of clarification. Because much variance was lost through dichotomization of the three variables trauma exposure, the measure on social support and the PTSS variable, an ANOVA was not run on the material. This dichotomization rendered analyses within the ANOVA paradigm quite meaningless. However, the plots give a picture of how the interaction effects work.

Age was close to zero-correlated with both the trauma variable and the dependent measures. Thus, this variable was not entered separately in step 1 of the regression analysis in order to control for this variable.

DISCUSSION

The study provided five main results. First, social network, measured as family, friends, neighbors and colleagues, was found to moderate the relation between trauma exposure and trauma reactions among relief workers. Second, there were clear differences between relief workers and UN soldiers as regards to what degree social network had a moderating effect on the relation between trauma exposure and trauma reaction. There was also a difference between the groups regarding whether it was the low- or high-exposure condition that was moderated by social support. Third, there were no social network relations that came out as being clearly more important than any other with respect to moderator or buffer effects among relief workers. Among UN soldiers, however, only friends and colleagues were statistically significant as moderators. Furthermore, these two measures were only significantly related to one dependent

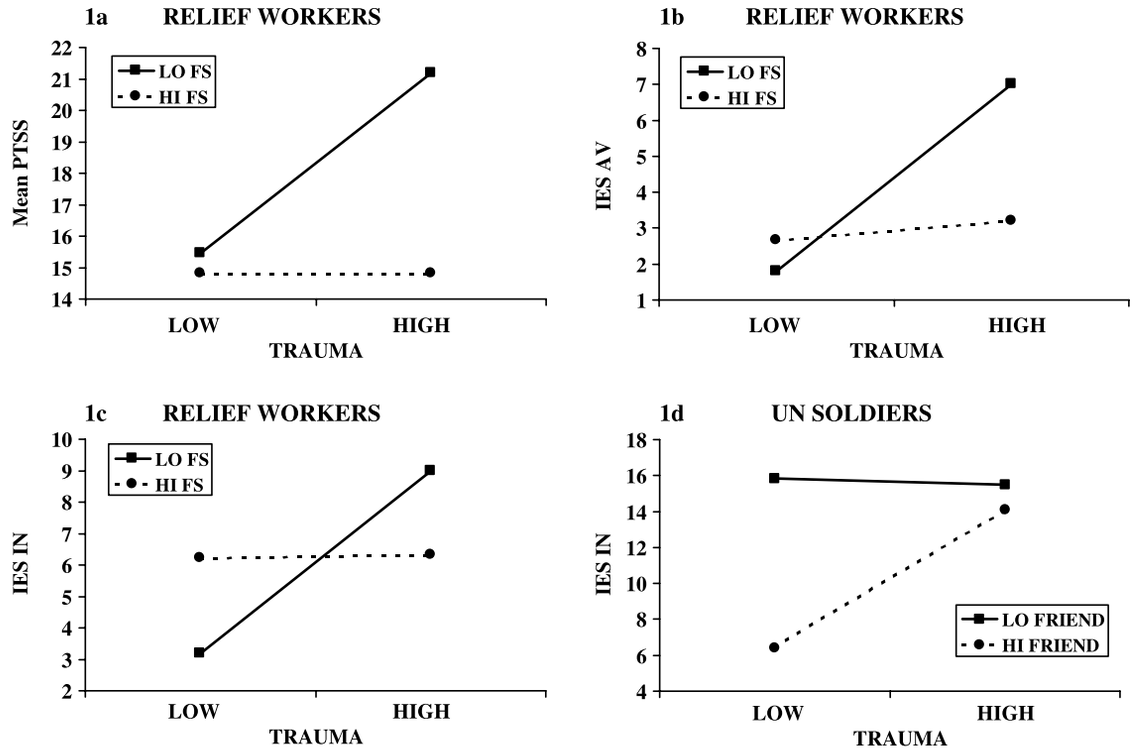

Fig. 1
FS = family support IES IN = IES intrusion
FRIEND = friend support IES AV = IES avoidance

variable each. Fourth, social network variables clearly exerted direct effects on symptoms among relief workers. Among UN soldiers these effects were not so clear (see Table 3). Fifth, UN soldiers were significantly more trauma exposed than were relief workers. They also revealed higher symptomatology on all comparable measures, except PTSS symptomatology. Thus, trauma exposure did not seem to be as important among UN soldiers regarding PTSS-related symptoms as it seemed to be among relief workers (see Table 3).

The UN soldiers were trauma exposed to a higher degree than were the relief workers. However, trauma was a significant predictor of PTSS symptoms among relief workers, contrary to what was the case among UN soldiers. Furthermore, relief workers revealed more PTSS symptoms, while the UN soldiers were higher on the intrusion and avoidance measures. This is an interesting result. The relief workers were the less trauma exposed, but exhibited more trauma-related symptomatology than did the UN soldiers, who were found to be significantly more trauma exposed. Thus, what has to be explained is why the group that is the less trauma exposed exhibited more trauma-related symptoms. This, however, may be interpreted in relation to some of the other results in this study.

There was a difference between the two groups regarding whether it was the low- or the high-exposure condition that was moderated by social network support (Fig. 1d). While social network seemed to be important to relief workers in buffering the effects of trauma exposure on trauma reactions, social network seemed to be relatively unimportant to UN soldiers. In addition to this, Fig. 1d shows that one of the two statistically significant interaction effects among UN soldiers is reversed relative to relief workers. Instead of exerting an effect in the high-exposure condition, as is the case among relief workers, it exerts an effect in the low-exposure condition.

The fact that UN soldiers are the more trauma exposed group, yet exhibit fewer PTSS symptoms, may be indicative of a higher threshold for trauma exposure among UN soldiers than is the case among relief workers. This would mean that UN soldiers may be more resistant to trauma exposure than relief workers. Interpreted along the line of Creamer, Burgess and Pattison (1992), the high IES scores that the UN soldiers exhibit may be indicative of high cognitive processing of trauma-related material, which in turn makes them less prone to trauma-related reactions. However, as we do not have data that allow us to reliably regard IES as a predictor of the PTSS measure, this is a conclusion that cannot be definitely drawn in this study. Another interpretation is that there is a difference between UN soldiers and relief workers with respect to motivational systems, causing them react differently. The fact that only two of the interaction effects were statistically significant and that one of these effects was reversed compared with the relief workers

supports this interpretation. UN soldiers were more trauma exposed than relief workers were. Yet, they did not reveal more PTSS symptoms. This may, along with the reversed interaction effect, plus the fact that social network support seemed not to moderate the stressor-trauma reaction dimension, indicate that social network has relatively low importance among UN soldiers. The interaction effect between support from friends and intrusion symptoms in the low-trauma exposure condition may indicate that UN soldiers are trained to specifically master highly demanding tasks. Thus, support from friends seems to be relatively unimportant in the high-exposure condition in this group, while it seems to be more important in the low-exposure condition, probably when faced with less demanding tasks.

There are some methodological problems with this study. Because the PTSS was dichotomized for the UN soldiers, this might have caused the PTSS and the IES to be inconsistent in that sample. That is, variance is lost, and this implies that outcome measures do not give a real picture of what is going on in the sample. The PTSS in this dichotomized version was originally designed to detect whether PTSD symptoms were present or not, while the IES was designed to assess the intensity of PTSD symptoms. However, the IES can be thought of as a measure that gives an indication of the way PTSD symptoms are being processed (Creamer *et al.*, 1992), while the PTSS is still a measure of PTSD symptoms. Thus, there is reason to believe that the present results do reflect some differences between UN soldiers and relief workers.

The two groups were differentially exposed to trauma. However, this difference pertained only to the degree and not the type of exposure. The UN soldiers who were low in exposure experienced trauma that was similar to the relief workers who were high on exposure. Strictly, this will alter the low vs. high category. It might have given a better picture of the situation if there had been three categories, namely low, medium and high. This would have caused a shift in degree of exposure between UN soldiers and relief workers. However, the effect of social support on the relation between trauma exposure and trauma reaction would still be the same, given that the interaction term was entered separately in the third step of the analysis and thus contributes to a unique portion of variance. Because trauma exposure differs only with respect to intensity and not according to type, there is reason to believe that this has not affected trauma support substantially, although the possibility exists. Furthermore, the participants were mostly men in both samples, a fact that makes the samples quite homogeneous. Also, time since trauma was quite similar in the two samples, as well as age. All these variables make the results reliable.

Personality dimensions may account for some of the difference between the UN soldiers and relief workers. However, further research is needed in order to clarify this. Along with the findings of Kobasa and Puccetti (1982), locus of control may be regarded as a reliable personality dimension capable of influencing social support as a moderator. Another personality dimension that may be regarded as capable of influencing this relation is sensation seeking. According to Solomon *et al.* (1995), sensation seeking is a significant stress-buffer in the aftermath of war trauma. Such motivational dimensions may influence social network variables as moderators to a greater extent than they are capable of exerting mediation effects within the relation domain between trauma exposure and trauma reaction. This may explain the fact that social network variables as direct predictors seemed to be more resistant among both groups than the same variables were as moderators. This is also in accordance with the results obtained by King *et al.* (1998). They found that social support had mediating effects but not buffer effects. Mediation or other direct effects of social network or social support on trauma reaction may be less prone to vary with personality variables than buffer effects are. Thus, motivational systems may be influential relative to moderator effects and not so much with respect to direct effects. If this is the case, it will be in accordance with the finding of Joseph *et al.* (1992), who found that a measure of crisis support was predictive of lower intrusive symptoms over and above both attributional and coping style. It must, however, be emphasized that our measure of social support is not one of crisis support, although one cannot exclude a possible conceptual relation between the two measures.

The results indicate that no specific kind of network relation was more significant than any other among the relief workers. Among UN soldiers, however, only available support from friends and colleagues were statistically significant as moderators. Family and neighbors seemed to be relatively unimportant as buffer variables. The fact that family was of so little importance may be explained by the fact that the UN soldiers were higher on trauma exposure than relief workers were. This may have caused a depletion of social resources. The effect of additional stresses on ordinary life events may put a strain on family life and social interactions in general, thus causing these relations to lose their stress-lowering effects, which in turn may reduce symptoms. This result is also in accordance with the finding by Overstreet *et al.* (1999), who found that availability of family support did moderate depressive symptoms, but not PTSD symptoms. However, their study was conducted on children, and as such is not directly comparable to our study.

The results may be clinically interesting. If social support has a significant stress-buffering effect among relief workers, but not among UN soldiers, and this difference is conceivable within differences in personality characteristics, then the effect of social support in a clinical setting will have to be evaluated in relation to such personality dimensions.

Conclusions

There are four major findings in this study. First, social network seems to be an important moderator of trauma-related symptoms. Second, there are major differences between UN

soldiers and relief workers with respect to this. Social network support seems to be close to irrelevant as a moderator among UN soldiers, and, when relevant, social network support seems to be related to the low-exposure condition. Third, no social network relations were found to be more important than any other, except among UN soldiers, where friends and colleagues were more consistently important than family and neighbors. Fourth, UN soldiers were significantly more trauma exposed than were relief workers. Nevertheless, they exhibited less PTSS symptoms than relief workers did. The results may have clinical relevance, as whether social support will be effective or not may depend on the clinical group.

Suggestions for further research

The present study indicates that there exist different motivational systems between UN soldiers and relief workers. However, these relations cannot be established by the present study. Further research is clearly warranted to elucidate earlier findings on these topics. Especially interesting is why the status of social network as a moderator of the relationship between trauma exposure and trauma reactions is so controversial. This kind of research has clinical relevance, as it is necessary to know whether high trauma exposure warrants different support systems from low-exposure conditions. Further research into personality systems is also needed, and whether such individual characteristics have different effects according to the degree of trauma exposure and according to the type of war-related work.

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