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Major depression and external stressors: the Lebanon Wars

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Abstract This article examines the effect of war events and pre-war depression on the prevalence of major depression during war. A total of 658 subjects aged 18-65 years were randomly selected from four Lebanese communities differentially exposed to the Lebanon Wars and were interviewed using the Diagnostic Interview Schedule (Arabic version). The individual levels of exposure to war events were assessed through a War Events Questionnaire. The lifetime prevalence of the DSM-III-R-defined major depression varied across the four communities from 16.3 to 41.9%; the final parameters predicting major depression since the onset of the wars were: depression before the wars and exposure to the wars. Both, individual levels of exposure to war and a history of pre-war depression, predict the development of depression during war.

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Introduction

A major input of the "medical model" researchers has been their leading role in shaping a new attitude towards the diagnosis of mental disorders, and what started as "Diagnostic Criteria for Research" has evolved into standard diagnostic criteria of the mental health classification of diseases (DSMs and ICDs). An important step in facilitating international cooperation in this area is the delimitation of the concept of culture-free diseases in mental health, a concept that has a large audience but by no means is universally accepted. Depression has been and is still intensively investigated for classification, pathology, and etiology, the state of the art being: depression is more or less a "clean" syndrome and some subgroups of it (bipolar affective disorders) are most probably inherited, whereas others (related to reserpine, steroids, etc.) can be precipitated by various substances. Still, the etiology of the majority of "depressions" occurring in a general population remains a matter of speculation and research. In another publication, we have addressed the appropriateness of excluding depressions related to bereavement from the general repertoire of major depression (Karam 1994). The debate about the importance of "psychosocial" factors is not settled yet and the question remains: Are they truly precipitants of depression? Keeping that in mind, we attempted to study the relationship between the phenomenon of depression and an important psychosocial stressor, namely the "Lebanon Wars". A high rate of lifetime depression was found especially in a previous pilot study conducted among Lebanese pregnant women (El-Khoury et al., in press).

Most studies on war and mental health have focused on military subjects (Helzer et al. 1979; Lifton 1973; Yager et al. 1984; Archibald and Tuddenham 1965; Brill and Beebe 1955; Grinker and Spiegel 1963; Egnedorf 1981; Laufer et al. 1984), considering war in general terms, with only a minority dissecting war into specific events (Lifton 1973; Yager et al. 1984; Egnedorf 1981). On the other

hand, most of the published research on civilians and war has dealt mainly with patients or with very small groups (Kinzie 1986; Nasr 1983; Saigh 1984) and most of all did not attempt a "quantification" of war exposure (Laufer et al. 1984; Orley and Wing 1978; Curran 1988; Porot 1957; Mira 1939; Hemphill 1941; Lewis 1942) with the exception of a few (e.g., Helzer et al. 1987). Those studies that have dealt with communities have considered war as a single variable and thus have been deprived of the advantages of "controls" (Orley and Wing 1978; Curran 1988); moreover, they have considered mental health in very broad terms (Zurayk and Bryce 1985) and did not look at specific psychiatric diseases. The Lebanon Wars offered us the possibility of filling in some of the gaps in the study of the relation of war to mental health, and more specifically, in this article, the relation between major depression and war.

Subjects and methods

Four Lebanese communities were selected for the present study (Karam 1992), they were deliberately chosen to represent increasing degrees of exposure to the Lebanon Wars: Bejjeh (BJ), a village 65 km northeast of the capital, Beirut, which witnessed only 1 h of shelling from the onset of the Lebanon Wars (1975) to the date of the data collection (14 years later); Kornet Shehwan (KS), a village 15 km northeast of Beirut; it was the target of sporadic shelling during most "rounds" of the Lebanon Wars; Ashrafieh (ASH), a county within Beirut that was heavily bombarded during most outbreaks of the wars; and Ain Remmaneh (AR), a county on the demarcation line in Beirut where the first battles were fought at the onset of the wars in 1975 and remained, continuously for 15 years, until 1990, one of the most dangerous areas in Lebanon.

Our starting units were randomly selected residential clusters from the four communities, all residential units within these clusters were marked down for interview. If a unit was found to be vacant or corresponded to a business office, the next building or another flat were chosen (using again the random digit method). All subjects living within these residential units were approached for interview provided they met the following three conditions: age 18-65 years, to have lived for the 2 years preceding the interview in the community in question (BJ, KS, ASH, or AR), and, finally, to be first-degree relatives of the head of the targeted household. A minimum (but not maximum) of three personal contacts with the subject were undertaken before classifying him/her as a refusal; those who accepted, signed a consent form and were interviewed separately in their own home; no financial compensation was offered.

The interview

The interviewing team consisted of psychologists with a Master's Degree trained by the first author. The interview consisted of sections on demographic information, war events, and the depression section of the Arabic version (Karam et al. 1991) of the Diagnostic Interview Schedule, version III (Robins et al. 1988). Additionally, we re-examined in a structured interview all possible depressive episodes for onset, duration, detailed symptomatology, dysfunction, changes in occupational status, consultation, and treatment.

The War Events Questionnaire (Karam et al., in press) was constructed in an attempt to quantify war exposure by asking about specific war events, namely, house damage, physical injuries, kidnapping, and business losses that has happened either to the individual himself or to a "very close person" (see Appendix). The war events were queried individually because we believed that individuals within the same community could be very different in their exposure to war; moreover, individuals from the most remote community (BJ) could have been more exposed than those residing in the center of combat (AR) simply because of commuting to the capital or losing relatives who reside in the dangerous area. Numerical scores, agreed upon by four judges, were assigned to each event. In addition, a witnessing factor was introduced for the house damage and physical injury events. This factor weighted the event score depending on the level of direct exposure of the subject to the specific event, e.g., whether the subject was there when it happened, was very close, observed from afar, or just heard about it. The Total War Score (WRS) was calculated for each individual as the sum of the war event scores weighted for each individual by the witnessing factor and the number of times each event occurred.

Statistical analysis was performed using SPSS for descriptive statistics. Chi-square tests were used in analyzing categorical variables and ANOVA in analyzing continuous variables. Logistic regression and analysis of variance were conducted using SAS.

Hypotheses

It was obvious for many fellow researchers, in and outside Lebanon, that we would find high rates of depression in Lebanon, a view not shared by most Lebanese who were proud of their "resiliency". We predicted that pre-war depression would predict the development of depression during the war. On the other hand, the principal investigator had predicted that we would find no relation between war events and the prevalence of depression. The remaining members of the team predicted the opposite.

Results

Demographic characteristics

A total of 658 subjects (age 18–65 years) were interviewed. The sample mean age was 40.0 years (SD 13.8 years) and females constituted 57.8% of its total (Table 1).

Table 1 Characteristics of the study sample

	Frequency	
	(*n*)	%
Gender		
Males	278	42.2
Females	380	57.8
Age (years)		
18–29	232	35.3
30–44	194	29.4
45–65	232	35.3
Marital status		
Single	268	40.7
Married	362	55.0
Divorced	25	3.8
Widowed	3	0.5
Region		
Bejjeh (BJ)	221	33.6
Kornet Shehwan (KS)	152	23.1
Ashrafieh (ASH)	123	18.7
Ain Remmaneh (AR)	162	24.6
Participated in the military[a]		
Yes	91	14.2
No	552	85.8

[a] 2.3% (15 subjects) did not specify whether or not they participated in the military

The response rate was 78% (10% refused and 12% were unavailable). Of the total sample, 14.2% stated that they participated actively (militarily) in the wars (1.9% of the women and 32.3% of the men). The Lebanese subjects who were ever involved actively in the military were, as expected, more likely at the time of the interview to be males residing in the most exposed community (AR).

Lifetime prevalence of depression

In this article, depression refers, unless otherwise specified, to major depression as defined in DSM-III-R, except for the requirement of excluding schizophrenia, schizophreniform and delusional disorder, since these were not screened for in our interviews. The lifetime prevalence of depression in our sample was 27.8%.

Predictors of major depression

Gender, military involvement, and major depression

The male/female differences seen frequently in epidemiologic studies on lifetime prevalence of depression are seen also in our sample with females reporting depression 1.5 times more frequently than males (30 vs 20%; $P = 0.01$). This is only true if subjects not involved in the military are considered alone. The male/female differences were no more significant if those involved militarily were included in the sample. The lifetime prevalence of major depression, then, rises from 20 to 24.5% in males but remains the same for females (30.5%; $P = 0.12$). Military involvement of females was too small to allow proper and confident statistical analysis for those involved in the military.

Age and major depression

There were no important differences in the lifetime prevalence of depression among the various age groups (18–29, 30–44, and 45–69 years) where the rates were 29.4, 26.3, and 27.6%, respectively. However, older cohorts reported a later age of onset where the mean age of onset of depression for the three age groups in Table 1 were as such: 17.8, 26.0, and 33.3 years, respectively ($P = 0.0000$). This point is explored elsewhere in more detail (Cross National Collaborative Group 1992).

War and major depression

The lifetime prevalence of major depression differed significantly between the regions: 26.1% for BJ, 24.8% for KS, 16.3% for ASH, and 41.9% for AR ($P = 0.0000$). We looked specifically at the subjects who were 25 years old or more at the onset of the wars since these would have had a "chance" to develop a depression before the wars (mean age of onset of first depressive episode in our sample being 25.4 years). These constituted 46.2% of our sample ($n = 304$), 59.2% of them being females. The lifetime prevalence of major depression among this group was 28%. There were clear differences in the prevalence of depressive episodes since war in the four studied communities with AR showing the highest prevalence (25.5%; 33.3% for males vs 19.4% for females), followed by ASH (15.8%; 18.5% for males vs 13.3% for females), BJ (11.3%; 7.9% for males vs 13.6% for females), and KS showing the lowest rate (4.1%; 0.0% for males vs 6.7% for females). The distribution of war events scores by the different regions for subjects 25 years or older at onset of war is shown in Table 2, and the relationship of War Score, transformed into a log function, to depression is shown in Fig. 1. As the log War Score increases, the proportion of cases depressed during war is also found to increase. War exposure was equally reported by civilian males and females. The only variable that exposed genders differentially was military involvement.

A stepwise logistic regression was performed to study the factors associated with the development of depressive episodes after the onset of the wars. The following variables were included as possible factors: exposure to war (log WRS), depression before the war, marital status, age, participation in military activity, and community where the subject was living. Two factor interactions of the above variables were assessed but none of them added significantly to the model. The following final parameters (Table 3) were highly significant: depression before the war and exposure to war, with the highest odds ratio being having had a depression before the war. When replacing sum of all war variables (log WRS) by exposure to spe-

Table 2 Distribution of War Event Questionnaire (WEQ) scores by region for subjects 25 years or older at the onset of wars ($n = 317$)

	House damage		Physical injury		Kidnapping		Business loss		Total war score	
	Mean (± SE)[a]	% zero[b]	Mean (± SE)[a]	% zero[b]	Mean (± SE)[a]	% zero[b]	Mean (± SE)[a]	% zero[b]	Mean (± SE)[a]	% zero[b]
Bejjeh (BJ)	1.90 (0.08)	33.7	1.49 (0.10)	78.2	1.59 (0.11)	87.8	1.41 (0.09)	79.2	2.51 (0.12)	25.7
Kornet Shehwan (KS)	1.84 (0.09)	31.7	1.65 (0.13)	68.3	1.16 (0.08)	82.9	1.34 (0.10)	75.9	2.33 (0.13)	25.6
Ashrafieh (ASH)	2.44 (0.13)	24.6	2.67 (0.16)	29.8	1.90 (0.15)	56.1	2.20 (0.16)	47.4	3.48 (0.12)	7.0
Ain Remmaneh (AR)	3.24 (0.06)	0.0	3.56 (0.13)	7.8	2.31 (0.17)	43.8	2.54 (0.18)	34.4	4.10 (0.07)	0.0

[a] Mean log war event score
[b] Percent of subjects with a zero war event score

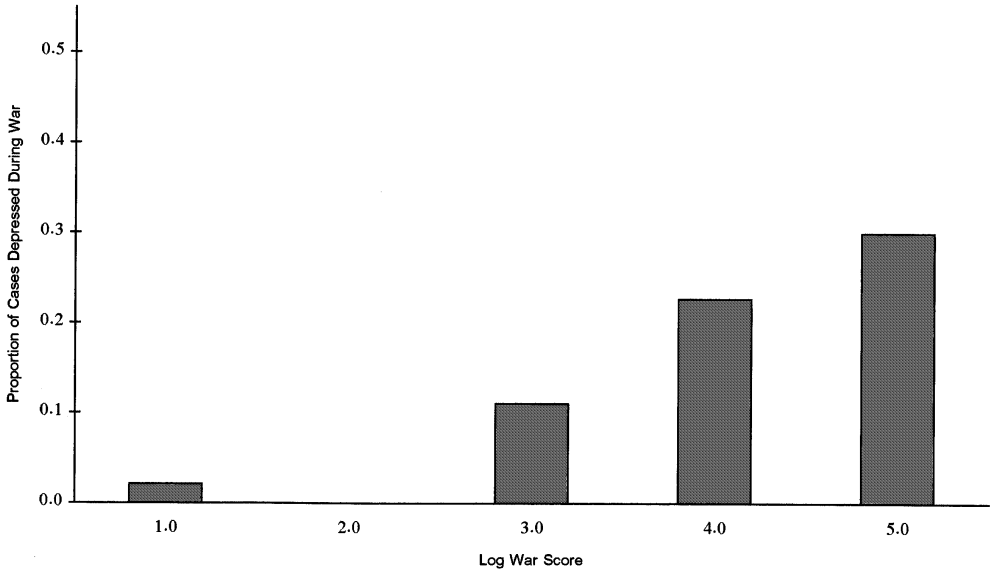

Fig. 1 War score and depression during war

Table 3 Results of Stepwise Logistic Regression Analyses Predicting Depression During War

Variables	Odds ratio	95% confidence interval	Standard error	*P*-value
Intercept			1.00	0.0001
Depression before wars	7.55	(3.17, 17.97)	0.44	0.0001
Log war score	2.42	(1.45, 4.04)	0.26	0.0007

Hosmer-Lemeshow Goodness of fit = 7.29, $P = 0.40$
Sensitivity = 67.6%, specificity = 72.1%
Area under receiver operating characteristics curve = 0.81

Table 4 Risk for having a major depressive episode since the onset of the wars by War Event Questionnaire scores

Variable[a]	Odds ratio	SE	95% confidence interval
House damage	1.96	0.24	(1.22, 3.13)
Physical injury	1.74	0.15	(1.30, 2.34)
Kidnapping	1.31	0.17	(0.94, 1.82)
Business loss	1.65	0.15	(1.22, 2.23)

[a] Log of war event score

cific war events; i.e., house damage, physical injury, kidnapping, and business loss, each of these at a time predicted by itself the occurrence of depression during war (in addition to depression before war, Table 4). As the log of, for example, house damage score increases by a unit, the risk for developing a major depressive episode during war increases by 1.96.

Discussion

The most important parameter predicting the development of depression during war has been demonstrated in this study to be a pre-war history of depression, and this was concordant with our expectations. Another parameter, exposure to war, was related to the reporting of major depression even when other factors (age, gender, marital status, involvement in the military, having a depression before the war, community, and education) were controlled for. This is an interesting finding and obviously open for further confirmation. There are specific points in this study that merit some attention:

1. Biases in reporting: This study is, in a way, close in its design to prospective studies since it does not start from identifying the symptom and, then, proceeding to recalling the event; in fact, questions about events are in totally different sections of the interview and come in before the DIS sections on depression and were dated separately from symptoms. However, one could argue that depressed individuals as a subgroup could have a differential recall; they might look into their past for meaningful stressors to explain their state (Brown and Harris 1978) or they might remember negative events more than non-depressed individuals because of a possible cognitive bias towards negative events, especially that time might affect the recall of events (Paykel and Hollyman 1983). A possible solution is offered by our study: Since all adults in a sampled residential unit were interviewed, data was collected on many couples (husband–wife). Theoretically, civilian husband and wife were exposed equally to most of the major war events if the witnessing factor and the distinction of victims (into self and very close) is canceled; hence, one would expect that their war scores should be close if the reporting of events was accurate, since they were interviewed separately. Indeed, we found that husbands and wives who have not participated militarily in the wars and who had lived together during the 15 years of the wars report similar WRS with no statistically significant differences ($P > 0.05$).

2. Demographic variables: The traditional effects of gender and education on the prevalence of depression did not

really hold by themsleves. This might be telling us that if the effects of stressors are being evaluated in a community study, then gender, education, and possibly other demographic variables might not hold by themsleves as important variables if these demographic variables are linked (even if only partially) to differential exposure to the stessors under study.

3. Explaining the "high" prevalence of major depression: There are numerous peacetime epidemiologic studies across the world yielding lifetime prevalence of depression ranging from less than 1% to more than 20% (Robins et al. 1984; Lee et al. 1987; Canino et al. 1987; Helgason 1964). As stated previously, our sample is not meant to represent the total Lebanese population; however, even if we delete the most exposed community (AR) from our calculations, we still have a lifetime prevalence of major depression of more than 20% in our subjects. Furthermore, in the subgroup of subjects with a WRS of zero, the lifetime prevalence of depression was 16.3%. Although our lifetime prevalence figures might look at first elevated, they are in fact close to many other well-planned internatioal epidemiologic studies assessing the prevalence of depression (Angst 1996; Weissman et al. 1981; Bucholz and Dinwiddie 1989; Kessler et al. 1994).

A possibility that could be invoked in explaining our "high" rates is that the depressions reported by the Lebanese sample are not as severe as those reported by subjects in other epidemiologic studies. A partial answer comes from the "retrospective" Hamilton scoring of the depressive episodes. Although the Hamilton Depression Rating Scale is devised to be used during a present episode of depression, we thought that this could be an indirect, albeit very imperfect, measure of the severity of depression. Every subject who reported on the DIS at least three of the symptom clusters required for a diagnosis of major depression (for 2 weeks) had his most difficult episode "Hamilton rated" at the end of the DIS section on depression: 80.1% of the most difficult DSM-III-R major depressive episode had a Hamilton Score ≥ 16. Another evidence for the severity of the reported depressive episodes is the number of individuals who consulted professionals and received treatment: 49% of the subjects reported having consulted a physician, other specialists, or took medications (52% of the females and 39.4% of the males). For a comparison, several epidemiologic studies on depression (Helzer et al. 1979; Weissman et al. 1981; Bucholz and Dinwiddie 1989) have shown that approximately one third of the depression cases receive professional help. Clearly, these figures speak against the mildness of these depressive episodes.

Another possibility is that selection effects might have contributed to the high prevalence, i.e., depressed subjects might stay differentially in the communities that are more affected by war, whereas "healthier" subjects might have moved out. Depressed subjects were found more likely to be displaced because of a hostile environment (26.8 vs 11.6%, respectively; $P = 0.0000$) than non-depressed subjects. Depression before war among subjects who were 25 years at the onset of war was not found to predict later exposure to war, and thus the selection-effect hypothesis is unlikely to be true in explaining the prevalence of depression in our sample.

Conclusion

This study was very difficult to undertake and the analysis was not easy to carry out in a war-devastated country because of the multiple logistic problems. The association of an environmental stressor (exposure to war) to the syndrome of major depression is demonstrated. The interplay between pre-war susceptibility to major depression and the level of exposure to the Lebanon Wars in determining the prevalence of depression was demonstrated also. A prospective study on the same sample was conducted, the results of which will be the subject of a later publication.

Appendix: The War Events Questionnaire

Victim:
1 Self (the interviewee)
2 Very close person

Witnessing:
The interviewee was:
1 Told about it
2 Saw it from far
3 Was close
4 Was there when it took place

Events:

House damage
0 Never
1 Shrapnels only
2 < 1 but > 3
3 Partially destroyed
4 Totally destroyed

Physical injury
0 Never
1 Almost injured
2 Superficial
3 Serious injury
4 Fatal (very close person)

Kidnapping
Time:
1 Number of weeks
2 Not returned

Business loss
1 Partial loss
2 Complete loss and fully regained
3 Complete loss and partially regained
4 Complete loss and not regained

Status:
1 Safe
2 Injured
3 Killed (very close person)

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