



Understanding Post-Conflict Mental Health: Assessment of PTSD, Depression, General Health and Life Events in Civilian Population One Year after the 2006 War in South Lebanon

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Abstract

Assessing the psychological impact of war is crucial to meet the needs of communities following conflict. To date, mental health in Lebanon's southern civilians has not been assessed in relation to the 2006 War. In 2007, face-to-face interviews were conducted in ten villages in South Lebanon. The sample, consisting of 991 adults, was chosen through random sampling using a cross-sectional design. The study evaluated PTSD, traumatic events, depression and general health status.

Of the total sample, 17.8% met threshold criteria for PTSD, 14.7% for depression and the average GHQ score was 4.31. Significant differences were observed across villages. This study revealed that war-related life events and exposure are highly associated with psychiatric problems one year following a violent conflict.

Keywords

Post-conflict; Mental health; PTSD; Depression; Social support; Civilians; Lebanon

Introduction

The country of Lebanon, particularly the south, has experienced over three decades of armed conflict, occupation and instability inflicted upon the civilian population. On the 12th of July 2006, an armed conflict resulted in a violent 33-day war known as the "2006 War". The month-long violent war resulted in more than 1,187 Lebanese civilian deaths, 4,092 injuries, and 900,000 internally displaced persons [1]. Though most of the destruction was concentrated in the south; to date, little is known of the psychological impacts of the 2006 War on the Southern population.

Individuals exposed to war are at risk of developing mental disorders; such as PTSD and depression [2]. Risk factors include female gender, low education, loss in social and material resources,

poor physical health, unemployment, and exposure to war trauma [3,4]. War experiences are not limited to exposure to violence [5]. Due to their enduring nature, life events resulting from the atrocities of war may be more detrimental to one's well-being than exposure [6].

Factors protecting against war-related psychiatric disorders include; social support, employment, good physical health, and a quick response time to individual and community recovery efforts [7,8]. In a community cross-sectional survey, Saab et al. found high rates of psychiatric distress one year after the Israeli military withdrawal in a population residing in South Lebanon [9]. In another survey conducted in a similar population in South Lebanon, high PTSD thresholds, depression and general psychiatric morbidity were found to be highly associated with trauma exposure five years after the withdrawal [10].

The current study assesses a civilian population one year post war to further examine the impacts of war as well as the impacts of war-related life events on well-being.

Method

Design and procedure

Ten villages from the South of Lebanon were selected for this study and surveyed in 2007, one year post-conflict. The sample was selected to be diverse in age, gender, and level of education. Villages B and D (B/D) as well as Kf, Kh and Hb (K/K/H) were combined and considered as a single sampling cluster. This was due to similar religious and socio-economic backgrounds in addition to an absence of demarcation between the villages. The combination of the sample is expressed as 7 villages. Because Lebanon is very socio-political with religious affiliation playing a fundamental part, the sample was also selected to be diverse in religion [10]. Village religious affiliation was as follows: JM and Q were predominantly Christian; K and D/B were predominantly Shiite; K/K/H and C were predominantly Sunni; and H was predominantly Druze.

The sample size calculation was a duplication of the strategy used in Farhood and Dimassi [10]. Taking 20% as a reasonable rate, with a precision level of 7% for a 95% CI, the sample size for the present study was determined to be 125 per village. In some villages such as D/B the quota could not be reached due to logistical and size difficulties resulting in the sample being set at 75. Multi-stage cluster sampling was used to randomly select units of land geographically defined by the government. Within the first geographic stratum a second sample was selected from amongst geographic subunits (i.e. rural blocks). Each block was sampled down to the level of neighborhood and then individual households.

Individuals, aged 20 or older, who were permanent residents of the selected areas for two years or more were eligible. Those who were physically or mentally unable to be interviewed were not selected for participation. The study employed random sampling with quotas to reflect the population distribution in the selected areas with regards to age and gender. Quotas were established using the 2005 United Nations report [11].

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The interviews were conducted by trained interviewers in-home and face to face using pen and paper [10]. The ethical approval for the study was granted by the American University of Beirut Institutional Review Board.

Instruments

Demographic and life-style variables: The demographics measured included age, gender, education level, marital and employment status, religious background, and total number of household members. The questionnaire inquired about participants' smoking habits, alcohol consumption, tranquilizer use, psychiatric treatment received in the past year, and current physical health status.

Trauma exposure and PTSD: The Arabic version of the Harvard Trauma Questionnaire was used to assess exposure to traumatic events and PTSD. The respondent was scored on 16 PTSD symptom items with scores exceeding the 2.5 cut-off point yielding a PTSD threshold. The Harvard Trauma Questionnaire psychometric properties are as follows: inter-rater reliability $r = 0.93$ for traumatic events, $r = 0.98$ for symptoms and on-week test-retest reliability $r = 0.89$, $p < 0.0001$ for traumatic events, and $r = 0.92$, $p < 0.0001$ for trauma symptoms [12]. Cronbach's alpha was calculated to be 0.87 for the symptom part of the Arabic version. The extent of exposure was quantified according to Harvard Trauma Questionnaire manual so each participant received a total "exposure" score. This version of the HTQ has been used in Arabic-speaking populations and validated in other conflict zones [10]. Observations were made on an association level and did not account for causal relationships; therefore PTSD scores were interpreted in terms of meeting threshold criteria.

Depression: The Beck Depression Inventory (BDI) is a 21 item inventory measuring characteristics, attitudes and symptoms of depression [13]. Scores above the cut-off point of 9 indicate moderate to severe depression. The internal consistency ranges from 0.73 to 0.92 with a mean of 0.86. It has a split-half reliability coefficient of 0.93, as well as high internal consistency with alpha coefficients of 0.86 and 0.81 for psychiatric and non-psychiatric populations respectively [14]. The BDI has been used extensively on Lebanese populations [10,15].

General health status: The General Health Questionnaire-28 (GHQ-28) was used to measure general health status [16]. The questionnaire consists of four subscales: somatic symptoms, anxiety, insomnia, social dysfunction and severe depression [16]. Multiple international assessments have demonstrated structural consistency in different settings and languages [17]. The sensitivity, specificity and internal consistency were found to be 0.87, 0.49, and 0.93 respectively [18]. The Cronbach's alpha for this study was 0.87. Items from each subscale were scored both individually and added together to compile a total score. Goldberg et al. reported varying thresholds over 15 sites worldwide [19]. Thresholds represented the 60th and 80th percentiles ranging from scores 3 to 8 with a mean score of 5. This version has been widely used on Arab and Lebanese populations [10,15,20].

Social support, life events and displacement: Social support was assessed with 8 items that asked participants about availability and improvement in social support after the 2006 War. The answers were coded 1 and 0, and summed to yield a social support score ranging from 0 (absence of social support) to a maximum score of 8 (strong social support). Life events were assessed with regards to social and financial problems due to the war. Social problems were assessed

with 4 items asking participants about problems in relationships with friends, family, or in their workplace. Financial problems were assessed with 4 items which included job loss, searching for a job, major change in income, and payment obligations or debt. Possible scores for both life events separately ranged from 0-4. Participants were also asked whether or not they were displaced during the war and for how long.

Data analysis

The effects of war exposure and war-related life events on mental health were analysed and compared across villages. At another level, bivariate analysis was carried out to depict factors associated with PTSD threshold and depression. Finally, multivariate logistic regression models; once with PTSD and once with depression as outcomes, were carried out to partition out the effect of covariates from that of the village. If village effect lost its significance, the difference in initial mental health outcomes observed could be attributed to the covariates controlled for in the model. The bivariate analysis was carried out using the Pearson Chi-square, Fisher exact test, independent t-test, and ANOVA t-test. Odds Ratios with respective 95% confidence intervals was reported along with p-values for the logistic regression models. Data was analyzed using SPSS18. All analyses were carried out at the 0.05 level.

Results

Demographic and lifestyle characteristics of the sample

A total of 991 adults from 10 village participated in the study. The sample was similar in age, gender, marital status; but differed significantly in terms of educational level and employment (Table 1). Cigarette, margarine and alcohol use also varied by village ($p < 0.001$, $p = 0.034$ and $p < 0.001$) while tranquilizer use amongst the total sample was reported at 9.7% with no difference between villages [10].

PTSD, traumatic event exposure, depression and general psychiatric morbidity

Of the total sample reporting PTSD symptoms, 17.8% met the threshold criteria with scores ranging from 10.4% to 27.0% across villages ($p = 0.002$). The mean number of traumatic events experienced and witnessed by the total sample was 4.46 and 5.19 respectively with exposure varying significantly across villages. Additionally, over 95% of the total sample reported to have experienced at least one traumatic event listed in the HTQ. The most commonly experienced events were being confined to the home because of dangerous events outside (68.2%) and being forced to evacuate under dangerous conditions (59.5%). Events witnessed followed similar patterns with 68.2% of participants witnessing a lack of food or water and 65.5% observing forced evacuations under dangerous conditions. The prevalence rate for moderate to severe depression was 14.7% with rates ranging from 7.7% to 23.0% ($p < 0.001$). The average total GHQ score for the total sample was 4.31 out of a possible 28 and differences between villages were significant ($p < 0.001$). The average GHQ subscale scores were 1.23 for somatization, 1.25 for anxiety, 1.49 for social dysfunction and 0.34 for severe depression. Differences in subscale scores among villages were also significant (Table 2).

Social support and war-related life events

Social support score (total sample average: 6.25 out of 8) and number of financial problems were seen as mediating variables with

Table 1: Frequency and percentage distribution of socio-demographic characteristics by village.

	JM	Q	H	K	D/B	K/K/H	C	Total	P-value
	N=155	N=152	N=155	N=144	N= 76	N=151	N=58	N=991	
Age	N (%)	N (%)	N (%)	N (%)	N (%)	N (%)	N (%)	N (%)	
20-29	46 (29.7)	51(33.6)	47 (30.3)	44 (30.6)	24 (31.6)	47 (31.1)	46 (29.1)	305 (30.8)	
30-39	38 (24.5)	38 (25)	41 (26.5)	42 (29.2)	21 (27.6)	39 (25.8)	44 (27.8)	263 (26.5)	
40-49	29 (18.7)	22(14.5)	25 (16.1)	25(17.4)	11 (14.5)	28 (18.5)	28 (17.7)	168 (17.0)	
50-59	16(10.3)	18(11.8)	18(11.6)	14(9.7)	10(13.2)	16(10.6)	16(10.1)	108(10.9)	
60+	26(16.8)	23(15.1)	24(15.5)	19(13.2)	10(13.2)	21(13.9)	24(15.2)	147(14.8)	0.999
Gender									
Male	74(47.7)	71(46.7)	72(46.5)	66(45.8)	36(47.4)	75(49.7)	75(47.5)	469(47.3)	
Female	81(52.3)	81(53.3)	83(53.5)	78(54.2)	40(52.6)	76(50.3)	83(52.5)	522(52.7)	0.998
Marital status									
Single	57(36.8)	48 (31.6)	60(38.7)	49(34.0)	29(38.2)	54(35.8)	36(22.8)	333(33.6)	
Married	92(59.4)	90 (59.2)	87(56.1)	91(63.2)	42(55.3)	90(59.6)	112(70.9)	604(60.9)	
Other	6(3.9)	14 (9.2)	8(5.2)	4(2.8)	5(6.6)	7(4.6)	10(6.3)	54(5.5)	0.089
Education									
Level 1	14 (9.0)	14 (9.2)	21(13.5)	18(12.5)	13(17.1)	31(20.5)	41(25.9)	152(15.3)	
Level 2	41(26.5)	67 (44.1)	71(45.8)	80(55.5)	34(44.7)	78(51.7)	90(57)	461(46.5)	
Level 3	100 (64.5)	71(46.7)	63(40.6)	46(31.9)	29(38.2)	42(27.8)	27(17.1)	378(38.1)	<0.001
Employment									
Unemployed	19(12.3)	16 (10.5)	5(3.2)	10(6.9)	10(13.2)	15(9.9)	17(10.8)	92(9.3)	
Employed	76 (49.0)	66 (43.4)	89(57.4)	73(50.7)	25 (32.9%)	60(39.7)	64(40.5)	453(45.7)	
Housewife	35 (22.6)	44 (28.9)	38(24.5)	50(34.7)	28(36.8)	55(36.4)	63(39.9)	313(31.6)	
Other	25 (16.1)	26 (17.1)	23(14.8)	11(7.6)	13(17.1)	21(13.9)	14(8.9)	133(13.4)	0.001

Level 1: below primary education; Level 2: not completed secondary education; Level 3: secondary education or more completed

effects varying by village ($p < 0.001$ for both). The reported number of social problems was similar in all locations. Fifty-five percent of the sample reported a decrease in income following the war. Income sufficiency differed between villages ($p = 0.001$) with over 42% of the total sample reporting insufficient income to support their basic needs (Table 2). Of the total sample, 71.1% was displaced from their villages for an average of 28.2 days. Frequency and duration of displacement varied significantly by village. For example, 97.2% of the sample population in K was displaced compared to only 9.0% in village H. Village H also experienced the longest mean duration of displacement at 36.1 days with the shortest in C at 22.2 days. Though only a small percent of village H inhabitants felt threatened to a point of leaving the village, yet those who felt the threat stayed away the longest (Table 2).

Factors associated bivariately with PTSD threshold and depression

The bivariate association between sample characteristics, PTSD and depression is shown in table 3. Gender ($p < 0.001$), marital status ($p = 0.024$), education level ($p < 0.001$) and employment status ($p = 0.035$) were all found to be associated with PTSD. As for depression, gender ($p = 0.019$), marital status ($p < 0.001$), employment ($p < 0.001$) and education ($p < 0.001$) all correlated significantly with depression frequency, as did income sufficiency ($p < 0.001$).

There was no difference between those displaced and those remaining in their homes in terms of reported PTSD and depression symptoms. Participants who reported having sufficient income to meet their basic needs were protected from symptoms. Additionally, participants who reported an increase in cigarette smoking and

tranquilizer use were more likely to have higher scores of PTSD and depression than those not reporting use.

In terms of PTSD, no associations were found in reported alcohol use. However, alcohol use correlated with lower rates of depression (15.9% of non-drinkers had depression versus 6.4% of drinkers, $p = 0.005$). Argileh use was not associated with PTSD and depression.

Study participants reporting physical health conditions were more likely to have higher scores for PTSD (25.6%), and to meet BDI criteria for depression (24.1%) than participants not reporting physical health conditions (Table 3). Specific illnesses associated with PTSD and depression symptoms included hypertension, heart disease, diabetes, high triglycerides, kidney disease, lung disease, digestive problems and back pain. Table 4 represents the factors associated with PTSD. Social support had an inverse relationship ($p < 0.001$) while having social and financial problems was associated with symptomology ($p < 0.001$ and $p = 0.017$). Participants scoring high for PTSD had experienced and witnessed significantly more traumatic events (experienced: 5.57 versus 4.22, $p < 0.001$; witnessed: 6.52 versus 4.90, $p < 0.001$). On average, participants scoring below the PTSD threshold also scored below the GHQ international standard mean and those meeting PTSD threshold scored above the mean. Participants with high PTSD scores also scored significantly higher than participants without psychiatric morbidity in somatization (2.97 versus 0.86), anxiety (2.91 versus 0.90), social dysfunction (2.66 versus 1.25) and severe depression (1.03 versus 0.19).

Participants with moderate to severe depression had lower social support scores ($p < 0.001$) as well as an increase in social ($p < 0.001$) and financial problems ($p = 0.023$). This group reported experiencing

Table 2: Mean and standard deviation of sample social, psychological and war-related characteristics by village.

	JM N=155	Q N=152	H N=155	K N=144	D/B N=76	K/K/H N=151	C N=158	Total N=991	P-value
Social support score Mean(SD)	6.25 (1.58)	5.93 (1.55)	6.53 (1.26)	6.64 (1.32)	5.59 (1.62)	6.24 (1.61)	6.23 (1.60)	6.25 (1.53)	<0.001
Life events Mean(SD)									
Social problems	0.24 (0.59)	0.45 (0.77)	0.30 (0.60)	0.34 (0.71)	0.38 (0.67)	0.28 (0.63)	0.30 (0.70)	0.32 (0.67)	0.127
Financial problems	1.5 (0.99)	1.9 (0.88)	1.7 (0.88)	1.5 (0.93)	1.8 (0.91)	1.6 (1.07)	1.9 (1.02)	1.7 (0.97)	<0.001
Income N (%)									
All needs met	35 (22.6)	36 (23.7)	41 (26.5)	23 (156.0)	12 (15.8)	34 (22.5)	23 (14.6)	203 (20.5)	
Most needs met	61 (39.4)	32 (21.2)	59 (38.1)	51 (35.4)	32 (42.1)	57 (37.7)	71 (44.9)	363 (36.7)	
Needs not met	59 (38.1)	84 (55.3)	55 (35.5)	70 (48.6)	32 (42.1)	60 (39.7)	64 (40.5)	424 (42.8)	0.001
Displacement during war N (%)	136 (87.7)	75 (49.3)	14 (9.0)	140 (97.2)	67 (88.2)	142 (94.0)	131 (82.9)	704 (71.1)	<0.001
Days of displacement Mean (SD)	27.6 (20.1)	28.6 (16.9)	36.1 (22.0)	31.2 (11.3)	26.1 (10.9)	31.4 (11.9)	22.2 (10.2)	28.2 (14.6)	<0.001
HTQ events Experienced Mean (SD)	4.41 (2.53)	4.97 (2.32)	2.39 (1.79)	4.92 (2.21)	5.06 (2.84)	5.47 (2.07)	4.41 (2.07)	4.46 (2.43)	<0.001
HTQ events Witnessed Mean (SD)	5.52 (3.02)	6.18 (2.55)	4.08 (2.45)	5.14 (2.36)	5.34 (2.49)	5.53 (2.08)	4.64 (2.35)	5.19 (2.56)	<0.001
PTSD N (%)	31 (20.0)	41 (27.0)	18 (11.6)	15 (10.4)	17 (22.4)	23 (15.2)	31 (19.6)	176 (17.8)	0.002
Depression N (%)									
Moderate to severe	17 (11.0)	35 (23.0)	12 (7.7)	14 (9.7)	13 (17.1)	21 (13.9)	34 (21.5)	146 (14.7)	<0.001
GHQ-28 score Total mean (SD)	3.99 (4.58)	6.03 (6.01)	2.98 (3.92)	3.45 (4.28)	5.03 (4.38)	4.13 (4.87)	4.90 (5.19)	4.31 (4.91)	<0.001
Somatization	1.15 (1.59)	1.62 (2.03)	0.94 (1.55)	0.99 (1.54)	1.41 (1.70)	1.13 (1.67)	1.47 (2.01)	1.23 (1.75)	0.004
Anxiety	1.14 (1.76)	1.91 (2.22)	0.87 (1.54)	0.74 (1.51)	1.26 (1.58)	1.39 (1.99)	1.40 (1.89)	1.25 (1.85)	<0.001
Social Dysfunction	1.38 (1.64)	1.89 (1.84)	1.05 (1.49)	1.43 (1.56)	1.96 (1.56)	1.30 (1.59)	1.68 (1.78)	1.49 (1.67)	<0.001
Severe Depression	0.32 (0.76)	0.61 (1.28)	0.12 (0.45)	0.29 (0.72)	0.39 (0.88)	0.31 (0.91)	0.35 (0.85)	0.34 (0.87)	<0.001

HTQ: Harvard Trauma Questionnaire. GHQ-28: The General Health Questionnaire

and witnessing more traumatic events than individuals not meeting criteria for depression (experienced: 5.38 vs. 4.21, $p < 0.001$, witnessed: 6.05 vs. 5.03, $p < 0.001$). Participants with depression were also more likely to have received psychiatric treatment in the past year ($p = 0.022$).

On average, participants with depression scored above the GHQ standard mean of 5, while participants without depression scored below it (10.58 versus 3.24, $p < 0.001$). Participants with depression, compared to the absence of symptoms, scored significantly higher in somatization (3.27 versus 0.88), anxiety (3.01 versus 0.95), social dysfunction (3.09 versus 1.22) and severe depression (1.21 versus 0.19) (Table 4).

Multivariate logistic regression models

At the multivariate level, eleven factors were significantly associated with PTSD (Table 5) and seven with depression (Table

6). Females were five times more likely to meet PTSD threshold than males ($p < 0.001$). However, both genders showed similar rates of depression. Employment was found to protect against depression with an OR of 0.42 when comparing employed individuals versus “others” (i.e. students, retirees or disabled persons) ($p = 0.008$). Though PTSD scores were higher in the 60+ age bracket, there was no significant difference across age groups. Therefore, age was not considered a risk factor. With regards to marital status, single status was considered to be a risk factor.

According to the logistic regression model for village comparisons in terms of PTSD and depression, the only villages of significance were Q and C (versus village K). Both Q and C had 2.6 times the rate of PTSD as K (Q vs. K: OR=2.59, $p = 0.010$ and C vs. K: OR=2.60, $p = 0.011$). With regards to depression, only village C had 2.25 times the rate as K ($p = 0.027$).

The ORs for social support score were 0.76 and 0.77 for PTSD

Table 3: Frequency distribution of PTSD and depression by individual characteristics.

	PTSD		Depression	
	Number/Total number (%)	P-value ^b	Number/Total number (%)	P-value
Gender				
Male	49/469 (10.4)		56/469 (11.9)	
Female	127/522 (24.3)	<0.001	90/522 (17.2)	0.019
Marital status				
Single	49/333 (14.7)		33/333 (9.9)	
Married	111/604 (18.4)		96/604 (15.9)	
Other	16/54 (29.6)	0.024	17/54 (31.5)	<0.001
Employment				
Unemployed	13/92 (14.1)		17/92 (18.5)	
Employed	67/453 (14.8)		43/453 (9.5)	
Housewife	82/313(26.2)		67/313(21.4)	
Other	14/133(10.5)	<0.001	19/133(14.3)	<0.001
Education^a				
Level 1	31/152 (20.4)		40/152 (26.3)	
Level 2	93/461(20.2)		76/461(16.5)	
Level 3	52/378 (13.8)	0.035	30/378 (7.9)	<0.001
Sufficient income for basic needs				
All needs met	26/204 (12.7)		12/204 (5.9)	
Most needs met	54/363 (14.9)		47/363 (12.9)	
Needs not met	96/424 (22.6)	0.002	87/424 (20.5)	<0.001
Displacement during the July 2006 war				
Displaced	131/705 (18.6)		110/705 (15.6)	
Not displaced	45/286 (15.7)	0.228	36/286 (12.6)	0.225
Cigarette use				
No	100/680 (14.7)		85/680 (12.5)	
Yes	76/311 (24.4)	<0.001	61/311 (19.6)	0.003
Argileh use				
No	151/814 (18.6)		127/814 (15.6)	
Yes	25/177 (14.1)	0.163	19/177 (10.7)	0.098
Alcohol use				
No	159/866 (18.4)		138/866 (15.9)	
Yes	17/125 (13.6)	0.193	8/125 (6.4)	0.005
Tranquilizer use				
No	138/895 (15.4)		107/895 (12)	
Yes	38/96 (39.6)	<0.001	39/96 (40.6)	<0.001
Any physical health condition				
No	91/659 (13.8)		66/659 (10.0)	
Yes	85/332 (25.6)	<0.001	80/332 (24.1)	<0.001

a: Level 1: below primary education; Level 2: not completed secondary education; Level 3: secondary education or more completed

Table 4: Mean and standard deviation of sample characteristics by PTSD and depression.

	PTSD			Depression		
	Below threshold	Above threshold	P-value ^a	None to mild	Moderate to severe	P-value ^a
Social support score Mean (SD)	6.37 (1.49)	5.69 (1.60)	<0.001	6.37 (1.45)	5.53 (1.75)	<0.001
Social problems Mean (SD)	0.27 (0.61)	0.59 (0.86)	<0.001	0.27 (0.60)	0.64 (0.92)	<0.001
Financial problems Mean (SD)	1.65 (0.98)	1.85 (0.95)	0.017	1.66 (0.97)	1.86 (0.97)	0.023
HTQ events Experienced Mean (SD)	4.22 (2.35)	5.57 (2.46)	<0.001	4.31 (2.36)	5.38 (2.59)	<0.001
HTQ events Witnessed Mean (SD)	4.90 (2.43)	6.52 (2.74)	<0.001	5.03 (2.52)	6.05 (2.67)	<0.001
GHQ-28 Mean (SD) Total	3.19 (3.64)	9.57 (6.42)	<0.001	3.24 (3.67)	10.58 (6.36)	<0.001
Somatization	0.86 (1.40)	2.97 (2.15)	<0.001	0.88 (1.40)	3.27 (2.15)	<0.001
Anxiety	0.90 (1.47)	2.91 (2.45)	<0.001	0.95 (1.54)	3.01(2.44)	<0.001
Social Dysfunction	1.25 (1.49)	2.66 (1.98)	<0.001	1.22 (1.45)	3.09 (1.97)	<0.001
Severe Depression	0.19 (0.58)	1.03 (1.46)	<0.001	0.19 (0.55)	1.21 (1.59)	<0.001
Received Psycx in past yearN (%)	164 (17.1)	12 (38.7)	0.002	137 (14.3)	9 (29.0)	0.022

a P-values < 0.05 considered significant. HTQ: Harvard Trauma Questionnaire. GHQ-28: The General Health

and depression respectively indicating a 24% and 23% decrease in symptomology per unit increase in social support ($p < 0.001$ for both). For every additional HTQ event experienced, subjects were 1.13 and 1.14 times more likely to meet threshold for PTSD ($p = 0.014$) or criteria for depression ($p = 0.002$), respectively. Similarly, every additional event witnessed was associated with a 1.20 increase in PTSD scores ($p < 0.001$). With each additional financial problem experienced, subjects were respectively 1.27 and 1.25 times more likely to have PTSD ($p = 0.026$) or depression ($p = 0.039$).

At the multivariate level, cigarette smoking was found to be significantly associated with increased PTSD scores (OR=1.77, $p = 0.008$) while tranquilizer use correlated with a three-fold increase in depression (OR=3.01, $p < 0.001$). Finally, having any physical illness was also a strong risk factor for both PTSD (OR=1.87, $p = 0.003$) and depression (OR=2.22, $p < 0.001$).

Discussion

The present study examined the psychological impacts of war in a civilian population one year post-conflict. Of the total sample, 17.8% met PTSD threshold and 14.7% qualified for moderate to severe depression. Predictor variables for PTSD and depression were experiencing and witnessing a greater number of HTQ traumatic war events, low social support score, experiencing more financial problems and scoring higher on the GHQ subscales. Findings suggest that both war trauma and war-related life events have a significant relationship with an increase in psychiatric morbidity. Similar findings have been empirically supported across studies in civilian populations exposed to conflict [10,21].

Female gender was a risk factor in this study for PTSD, a

Table 5: Multivariate logistic regression model of PTSD.

Variable	OR	95% CI	P-value
Age			
30's vs. 20's	1.87	(1.06, 3.31)	0.032
40's vs. 20's	2.16	(1.13, 4.414)	0.020
50's vs. 20's	1.32	(0.60, 2.90)	0.487
60+ vs. 20's	3.05	(1.31, 7.14)	0.010
Gender			
Female vs. Male	5.05	(3.23, 7.89)	<0.001
Education^a			
Level 2 vs. Level 1	2.10	(1.12, 3.95)	0.021
Level 3 vs. Level 1	1.35	(0.69, 3.01)	0.325
Marital status			
Married vs. Single	0.56	(0.34, 0.92)	0.023
Other vs. Single	0.39	(0.16, 0.94)	0.035
Village			
Q vs. K	2.59	(1.26, 5.33)	0.010
H vs. K	2.21	(0.97, 4.31)	0.060
D/B vs. K	1.85	(0.79, 4.31)	0.158
K/K/H vs. K	1.59	(0.75, 3.38)	0.228
C vs. K	2.60	(1.24, 5.47)	0.011
Social support score	0.76	(0.67, 0.85)	<0.001
Number of financial problems	1.27	(1.03, 1.57)	0.026
HTQ events experienced	1.13	(1.02, 1.24)	0.014
HTQ events witnessed	1.20	(1.1, 1.31)	<0.001
Cigarette smoking	1.77	(1.16, 2.70)	0.008
Any physical health condition	1.87	(1.23, 2.85)	0.003

a: Level 1: below primary education; Level 2: not completed secondary education; Level 3: secondary education or more completed. HTQ: Harvard Trauma Questionnaire

Table 6: Multivariate logistic regression model of depression.

Variable	OR	95% CI	P-value ^a
Village			
JM vs. K	1.00	(0.45, 2.23)	0.997
Q vs. K	2.00	(0.97, 4.15)	0.062
H vs. K	1.20	(0.50, 2.87)	0.688
D/B vs. K	1.03	(0.43, 2.48)	0.949
K/K/H vs. K	1.28	(0.60, 2.76)	0.523
C vs. K	2.25	(1.10, 4.61)	0.027
Employment			
Unemployed vs. other	0.75	(0.33, 1.68)	0.481
Employed vs. other	0.42	(0.22, 0.80)	0.008
Housewife vs. other	1.05	(0.57, 1.92)	0.879
Social support score	0.77	(0.69, 0.87)	<0.001
Number of financial problems	1.25	(1.01, 1.54)	0.039
Number of HTQ events experienced	1.14	(1.05, 1.24)	0.002
Tranquilizer use	3.01	(1.81, 5.01)	<0.001
Any physical health condition	2.22	(1.49, 3.32)	<0.001

a: P values <0.05 considered significant. HTQ: Harvard Trauma Questionnaire.

finding empirically supported across studies [2]. Although high rates are consistent for female gender, such high gender variability may be attributed to methodological issues in symptom reporting. On the psychological theories of PTSD, Brewin and Holmes found that females often disclose more than males which resulted in the designation of higher PTSD prevalence rates [22]. Substance use, cigarette smoking and tranquilizer use were associated with an increase in PTSD and depression respectively. No associations were observed with regards to alcohol intake. This may be due to reporting bias or a low number of participants consuming alcohol because of cultural and religious influences prohibiting use. The current findings raise questions regarding motive for use (i.e. coping, self-medicating) and the causal directionality of the relationship between substance use disorder and exposure to trauma. In a longitudinal epidemiologic study examining the possible association between trauma exposure and substance use disorder, the authors Breslau et al. found no direct link to support a relationship between experiencing a traumatic event and development of a substance use disorder [23]. Further, the current study showed strong associations between tranquilizer use and both PTSD and depression. The increase in use following war may be attributed to war-related factors such as socioeconomic concerns, psychological problems, physicians overprescribing “relaxing pills”, and pharmacies being able to dispense medications without prescriptions [9]. Subjects reporting general physical health conditions had 1.87 times the rate of PTSD and over twice the rate of depression compared to subjects without physical problems. Studies have shown that psychopathology and physical pathology often co-occur immediately following a disaster with elevated rates of poor health persisting for years following a traumatic event [24]. With regards to employment, being employed did have a protective effect against depression. Bivariately, housewives had the highest rates of both PTSD (26.2%) and depression (21.4%). Housewives in this region are typically female and the primary caretaker of both children and of the home [4,25].

Social support is a crucial part of recovery following a traumatic event [8,26] and has been shown to mediate the psychological impact of war exposure [15,27]. When assessing the relationship between social support and mental health one year post-conflict, social support score was inversely related to both PTSD and depression. When comparing rates across villages, the protectiveness of social support was illustrated. For example, villages K and H had the least PTSD and depression and the highest social supports core out of all villages in the sample. The opposite was true for village Q who had the second-lowest social support score and had the highest scores for both PTSD and depression.

According to the 2006 UNIFIL report (UNIFIL, background, online) [1], the South of Lebanon saw the destruction of an estimated 15,000 homes and severe damage to infrastructure such as bridges, roads, factories, water and sewage plants, dams and electrical plants, which would have inhibited the flow of vital resources to this region. Distress caused by such social and material resource loss can place individuals at risk for poor psychological health [28]. Variability in perceived resource loss may explain why some villages located in close proximity to more violence had lower PTSD and depression scores than those who did not see as much destruction. For example, village K had the lowest percentage of PTSD scores but saw some of the worst aerial bombing and ground fighting during the war compared to the other villages, according to official reports [1]. This village also had the highest scores for social support in addition to swift recovery efforts which may have had an additional protective effect. Indeed, following the 2006 War, recovery efforts were seen as a vital part of individual and community recovery [29].

The subsequent life events that occur during and after conflict (i.e. social, financial and material loss) have enduring stressors which may be more significant than direct exposure in terms of coping and predicting short and long term mental health outcomes [6,28]. In this study, a strong association between financial hardships one year post-war and both PTSD and depression was observed with significant differences in post-conflict financial problems across villages. This could be indicative of varying levels of distress caused by elevated financial hardships.

It is interesting to note that PTSD was lower for residents post-2006 War compared to reported PTSD five years after an occupation (17.8% in 2007 from 24.1% in 2005) [10]. Previous exposure to war trauma may have resulted in better adaptation to the 2006 traumatic war events on a community level [7,26].

Perhaps an illustration of this would be the rapid decline in IDPs the first 2-3 days after the war in which nearly 900,000 people immediately returned to their homes and communities despite the destruction to homes, limited resources and security threats [1].

Limitations and future research

Study limitations include possible recall bias resulting from participants' retrospective accounts which interviews were based upon. This was a descriptive community assessment and did not seek to identify clinical diagnoses. Future studies utilizing structured clinical interviews and diagnoses should be conducted and compared to these findings. Additionally, specific daily hassles, as measured by the breakdown of infrastructure contribute to the development of mental illness but were not assessed in our study.

Conclusion

One year after the 2006 War, factors such as trauma exposure, social support and war-related life events significantly influenced development and intensity of psychiatric morbidity in the Southern Lebanese civilian population. In terms of intervention planning, the use of a psychosocial approach to target both daily stressors and well-being is recommended. Emphasis should be placed on creating sustainable mental health structures to ensure the well-being of communities and individuals in times of conflict and peace.

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