

Effect of trauma on quality of life as mediated by mental distress and moderated by coping and social support among postconflict displaced Ethiopians

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Abstract

Objective An understanding of how quality of life is affected by severe trauma and mental distress may facilitate better intervention strategies for postconflict internally displaced persons, by identifying mediators, moderators, and independent risk factors. We investigate the pathways involved in this process and also study the moderating roles of coping strategies and perceived social support.

Method A random sample of 1193 (62% women) internally displaced Ethiopian adults living in shelters in Addis Ababa were interviewed with instruments capturing the relevant concepts, including SCL-90-R and WHOQOL-BREF. Path analysis was employed to elaborate the mediating and moderating effects. Self-reported living conditions were also assessed.

Results Mental distress increased and quality of life decreased with age. Mental distress mediated the effects of trauma in reducing the quality of life, and some trauma also reduced quality of life directly. These effects remained after adjusting for living conditions. Living conditions

were related to quality of life also on their own. Coping strategies and perceived social support influenced mental distress and quality of life directly as well as indirectly by moderation, in part gender specific.

Conclusions Intervention strategies aimed at reducing mental distress, modifying coping strategies, and encouraging social support may turn out to be useful in increasing the overall quality of life in postconflict situations, and are worth considering as complements to strategies that improve the living conditions.

Keywords Coping strategies · Mental distress · Postconflict displaced persons · Quality of life · Traumatic life events · Social support

Introduction

The UN Refugee Agency, the United Nations High Commissioner for Refugees (UNHCR), distinguishes between refugees and internally displaced persons as follows: “Both groups often leave their homes for similar reasons. Civilians are recognized as ‘refugees’ when they cross an international frontier to seek sanctuary in another country. The internally displaced, for whatever reason, remain in their own states.” [1].

Currently, there are around 23.7 million internally displaced persons, half of them in Africa, in 52 different countries living amidst war and persecution. They have little legal or physical protection and a very uncertain future, since they are not covered by international laws regarding refugees [1].

Although there exist some studies regarding the health status, quality of life, and rehabilitation efforts concerning refugees who have been afforded asylum in developed

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countries, fewer such studies are available concerning internally displaced persons still living in their (often low-income) countries [2–7]. Children who grow up in war-like situations that persist for years are exposed to various forms of childhood trauma before they as adults are exposed to further trauma related to the process of displacement. Undoubtedly, various types of severe trauma these persons have gone through lead to higher mental distress and lower quality of life, but further research is needed to understand the pathways underlying this process. Efficient intervention strategies to rehabilitate and assimilate these persons into the society will be facilitated by a deeper understanding of the role of social support and coping strategies employed by the subjects living in this environment. An understanding of which of the coping strategies that are of benefit and which are dysfunctional can be incorporated in the sort of intervention strategies employed. It is also important to have an assessment of how beneficial social support is, or its role in general, in order to choose between different intervention strategies adequately.

During the past three decades, Ethiopia has been ravaged by large-scale civil war and famine. A large number of people have suffered traumatic experiences being involved in the lengthy civil war that finally led to Eritrea, which was formerly a part of Ethiopia, becoming an independent state [8]. According to the estimates of the Ethiopian Disaster Prevention and Preparedness Commission, about one million Ethiopians were displaced as a result of famine and war by the time of the establishment of an interim government in Eritrea in 1991 after a lengthy civil war. Thus, there are currently about 55,000 internally displaced persons in the Ethiopian capital Addis Ababa who were forced to leave Eritrea. For this population, we explore here the likely pathways underlying the relationships between trauma, mental distress and quality of life, and we also investigate the moderating roles played by different coping strategies and perceived social support. Elucidating whether a characteristic is a mediator, a moderator, or an independent risk factor is helpful when planning rehabilitation or intervention strategies [9, 10].

Method

Participants

The displacement of the respondents began from Eritrea around 1990–1991. They had suffered tremendous hardships during their travel to Addis Ababa (exhaustion, lack of food and water, disease, combat situation, torture, witnessed death of family members), where they arrived

around 1991–1992. The average travelling time was estimated as 6.7 (\pm SD 8.4) months.

This study was conducted during 1997–1998. From a list comprising 8909 registered persons living in the Kaliti and Kore temporary shelters of Addis Ababa, 1208 randomly selected respondents between the ages 18 and 60 years (one from each household) were approached for participation. All agreed to participate, but because of missing records on some of the variables, 15 respondents were excluded from the analyses. This sample has been described elsewhere [2, 5] and has also been reported in detail [6].

Instruments

All the instruments were translated into the Ethiopian official language Amharic. All the interviewers were given a 3 months training by accredited trainers from Europe, and the instruments were then pre-tested in a pilot study. The instruments were culturally validated and translated in a seven-step procedure as described earlier [2, 5].

Sociodemographics

Sociodemographic information regarding the respondents included gender, age, country of birth, ethnic group, marital status, literacy, religious activity, the route followed during displacement, and the shelter of residence [6].

Trauma

Three measures captured childhood trauma and one measure captured trauma related to displacement. Traumatic load due to family history of psychiatric illness was denoted by mental problems in parents or siblings, captured by whether or not a parent or sibling had mental illness or a parent had alcohol problems. Childhood maltreatment was given by the total number of yes-responses obtained through the question ‘When you were growing up, did anyone in your household do some of the following things often to you?’, followed by a series of 13 questions with a ‘yes-no’ response to each, comprising ‘insulting you or swearing at you’, ‘threatened to hit’, ‘pushed, grabbed or shoved you’, and so on, including ‘choked you’ and ‘burned and scalded you’. Traumatic childhood life events were evaluated by the total number of affirmative responses among 16 questions derived from Harvard Trauma Questionnaire, Section I [11, 12], and were posed regarding the life period before 12 years of age. Traumatic life events related to displacement were evaluated by the same questionnaire, but posed regarding the period beginning two years before displacement and upto the time of arrival at the shelters.

Mental distress

Mental distress was evaluated by the self-report ninety-item Symptom Check List (SCL-90-R), which is a general standardized measure of psychopathology [13]. It has been tested [14, 15] and employed in various cultural and clinical settings including those concerning trauma victims [16–18]. The symptom level of each item of the SCL-90-R is rated by the subject on a five-point scale of distress, from ‘not at all’ (score 0) to ‘extremely’ (score 4). The average of the scores of these 90 items, called the global severity index (GSI), indicates an overall degree of mental distress. The items of the SCL-90-R are known to factorise into nine primary symptom dimensions, denoted by SOM (somatisation, 12 items), OCD (obsessive-compulsive, 10 items), IPS (interpersonal sensitivity, 9 items), DEP (depression, 13 items), ANX (anxiety, 10 items), HOS (hostility, 6 items), PHO (phobic anxiety, 7 items), PAR (paranoid ideation, 6 items), and PSY (psychoticism, 10 items), comprising in all 83 items. The remaining 7 items are called additional items and are usually not reported. For each of these nine dimensions, the average score of the items comprising this dimension constitutes the score of that dimension. Since a relatively large number of subjects will usually have a score 0 (not at all) for a given item, and the score digits range from 0 to 4, the mean scores for a large group often obtain values less than 1.

Quality of life

Quality of life was assessed by an instrument called the WHOQOL-BREF, developed and validated by WHO in several studies [19, 20]. Besides the first two items of general nature, the remaining 24 items of the instrument are known to factorise into four domains of quality of life, denoted by ‘physical health’ (domain 1, 7 items), ‘psychological’ (domain 2, 6 items), ‘social relationships’ (domain 3, 3 items), and ‘environment’ (domain 4, 8 items), respectively.

Coping strategies

Coping strategies were assessed by a list of ten items adapted for the survey [6]. To each item, the respondent was asked to respond with ‘this is like me’ or ‘this is not like me’. The instrument roughly captures the three coping strategies often described in the literature as task-oriented, avoidance-oriented, and emotion-oriented coping strategies [21–23].

Perceived social support

Perceived social support was captured in a series of eight statements, partly in line with the Social Provisions Scale

[24], with the response ‘agree’ or ‘disagree’ to each statement [6]. These statements roughly capture the components reassurance of worth, reliable alliance, and guidance. The total number of ‘agree’ among these eight items constituted the overall perceived social support.

Self-reported indicators of living conditions

The subjects were asked a number of questions with a ‘yes-no’ response to each, that captured the living conditions of the shelters. These included questions about whether the accommodation was too cramped, a bed/mat/mattress was available, private facilities were available, toilets or latrines were available, if there was sufficient food and water, if protection against animals and insects was provided, if the organizational support was enough, if the subject’s health was good or very good, or whether the subject had experienced loss of general benefits during the last year.

Statistical analyses

All the statistical analyses were performed using the SPSS software version 14.0 [25]. Gender differences in quantitative scores, adjusting for sociodemographics, were evaluated by ANCOVA. When predicting a quantitative score with a set of relevant variables, we employed multiple linear regressions. Partial correlation coefficients were calculated to assess relationships between two quantitative variables when controlling for other variables.

Structural Equations Modelling by AMOS 6.0 [25] was employed to evaluate the mediating and moderating effects of the variables specified by models with path diagrams. This software performs analysis of moment structures through maximum likelihood estimation. The approach includes, as special cases, many well-known conventional techniques, including the general linear model, regression analysis, and common factor analysis. We employed standardized variables (obtained by subtracting the mean and dividing by the standard deviation) in path analysis and in regression analysis, in order to reduce the problem of multicollinearity which partly (but not exclusively) arises when interaction terms are introduced in the analysis.

To investigate whether a variable X is a mediator between variable A and variable B by means of path analysis, one draws a direct path from A to B in a first analysis, and then adds in the next analysis two paths, one going from A to X and the other from X to B. If X is a significant mediator, the weight of the path from A to B will decrease substantially in the second analysis compared to the first.

To investigate whether a variable X moderates the effect from variable A to variable B by means of path analysis, the interaction term XA (X multiplied by A) is constructed.

The analysis then contains a path from A to B, from X to B, and from XA to B. If the path from XA to B is significant, then X is said to be a significant moderator.

There are a large number of measures in the literature used for evaluating model fit and model comparison, derived from different theoretical perspectives, and there is no consensus about which measures that are generally suitable. However, it is generally agreed that the significance of the chi-square measure of fit is not appropriate [26] when the sample size is larger than about 100 (as is the case in this paper), because this measure is then almost always significant for all models.

For model comparisons in this paper, we have selected seven measures that capture model evaluation from several different theoretical perspectives: CMIN/df is the minimum value of sample discrepancy divided by its degrees of freedom (range 1 to more; smaller values preferable); AGFI, the adjusted goodness of fit index (larger values preferable); CFI, the comparative fit index in comparison with the independence model (range 0 to 1; larger values preferable); NNFI (TLI), the non-normed fit index in comparison with the independence model (range 0 to 1; larger values preferable); RMSEA, the root mean square error of approximation based on population discrepancy (range 0 to more; smaller values preferable); AIC, the Akaike information criterion for which simple well-fitting models get low values and complex poorly-fitting models get high values (smaller values preferable); and HOELTER (0.05), the largest sample size for which one would accept at 0.05 significance that the model is correct (larger values preferable). AMOS 6.0 calculates all these measures.

Results

Descriptives

The sample consisted of 749 (62.4%) women and 451 (37.6%) men. The mean age was 34.2 (\pm 9.4) years in women and 33.7 (\pm 10.5) years in men. For the total sample, 46.5% were born in Eritrea and 52.3% were born in what comprises Ethiopia today. As regards ethnicity, 44.8% were Tigre, 44.1% were Amhara, 9.8% were Oromo, and the rest belonged to other ethnicities. Only 36.3% had the status of being married, whereas 16.8% were widowed, 18.9% were separated, 6.6% divorced, and 21.4% never married. Literacy, as measured by reading ability, was present among 70.4% (in most of the men and about half of the women). A large majority of the subjects were (Orthodox) Christians (95.1%), and a small proportion were Moslems (3.2%). About half of the subjects (50.9%) attended religious services regularly. During displacement from Eritrea to Addis Ababa, the majority of

the subjects followed the central southward route along the highway (77.8%), some followed the eastern route through Djibouti (15.3%), and still others followed the western route through Sudan (5.7%). About two-thirds resided in the shelter Kore (66.8%), and the remaining resided in the shelter Kaliti (33.2%).

Mental problems in parents or siblings were reported by 10.1% of the women and 16.6% of the men. The gender specific sample mean of the total number of childhood maltreatment items was 0.31 in women and 0.67 in men. The gender specific mean of the total number of traumatic childhood life events was 0.26 in women and 0.86 in men. For the total number of traumatic life events related to displacement, the gender specific sample means were considerably higher, 2.57 in women and 4.31 in men.

Mental distress in relation to sociodemographics and trauma

A multiple regression analysis with GSI (global severity index of the SCL-90-R) as the dependent variable and with all the sociodemographic variables as independent variables showed that the regression coefficients for gender ($\beta = 0.155$, $P < 0.001$) and for age ($\beta = 0.094$, $P = 0.019$) were significant; women had significantly higher GSI compared to men, and GSI increased with age. Multiple regression analyses separately for the two genders showed that GSI increased significantly with age only for women ($\beta = 0.118$, $P = 0.015$), but not for men ($\beta = 0.006$, $P > 0.9$).

Figure 1 displays mean scores of each of the SCL-90-R dimensions obtained by women and men, respectively. Gender differences in each of the nine SCL-90-R dimensions were investigated by ANCOVA, adjusting for the sociodemographic variables. Women had significantly higher mean scores than men on all the dimensions except for paranoid ideation, which showed no significant gender difference. The dimension DEP (depression) had particularly high mean levels in both genders, compared to the other dimensions.

Table 1 shows the results of multiple linear regression analyses employing each of the SCL-90-R dimensions as the dependent variable in turn, and entering all the four trauma variables together with age as independent variables. The table shows that each of the four trauma variables predicted significantly higher global mental distress GSI in both genders. Traumatic life events related to displacement and mental problems in parents or siblings predicted significantly higher mental distress for essentially all of the SCL-90-R dimensions in both genders.

Fig. 1 Mean scores and 95% confidence intervals for the nine mental distress dimensions of the SCL-90-R separately for the two genders

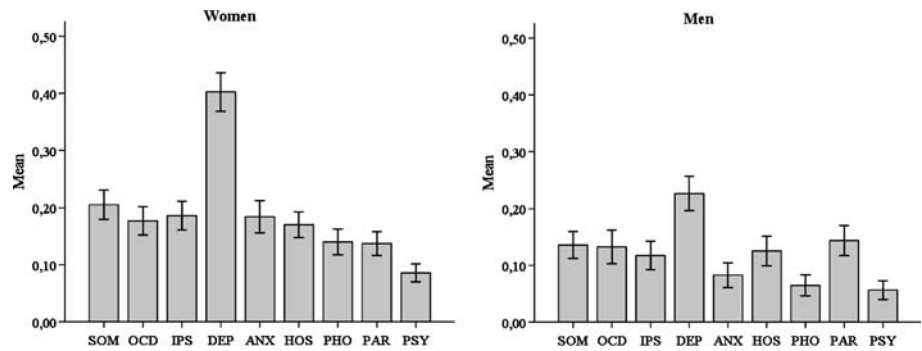


Table 1 Relationships between each dimension of the SCL-90-R, respectively, and the four trauma variables^a

SCL-90-R dimensions	Mental problems in parents or siblings		Childhood maltreatment		Traumatic childhood life events		Traumatic life events related to displacement	
	Women	Men	Women	Men	Women	Men	Women	Men
GSI (global severity index)	0.159***	0.167***	0.109**	0.122*	0.102*	0.151**	0.279***	0.146**
SOM (somatisation)	0.185***	0.068	0.141***	0.053	0.011	0.132**	0.218***	0.128**
OCD (obsessive-compulsive)	0.103**	0.169***	0.106**	0.081	0.058	0.131**	0.240***	0.137**
IPS (interpersonal sensitivity)	0.077*	0.139**	0.010	0.108*	0.145***	0.122*	0.230***	0.131**
DEP (depression)	0.125***	0.159***	0.046	0.139**	0.138***	0.131**	0.266***	0.119*
ANX (anxiety)	0.136***	0.168***	0.125**	0.128*	0.076	0.114*	0.256***	0.130**
HOS (hostility)	0.156***	0.135**	0.128***	0.064	0.075	0.182***	0.266***	0.099*
PHO (phobic anxiety)	0.103**	0.106*	0.036	0.161**	0.109**	-0.000	0.200***	0.148**
PAR (paranoid ideation)	0.183***	0.167***	0.123**	0.086	0.052	0.107*	0.235***	0.074
PSY (psychoticism)	0.099**	0.158***	0.157***	0.055	0.053	0.145**	0.217***	0.143**

^a Each SCL-90-R dimension was used as the dependent variable in turn in multiple linear regression, where the four trauma variables of the table together with age were entered as independent variables. The values are standardized regression coefficients

* $P < 0.05$; ** $P < 0.01$; *** $P < 0.001$

Quality of life in relation to sociodemographics and trauma

Correlation analyses between each of the four domains of quality of life (WHOQOL-BREF) and each of the sociodemographic variables controlling for the remaining, showed that increasing age was correlated with decreasing quality of life for each domain and each gender, and these correlations were significant in all cases except for Domain 4 (environment) among women and for Domain 3 (social relationships) among men. Among women, the marital status of being never married (compared to being married) was correlated significantly positively with domains 1 (physical health), 2 (psychological) and 4 (environment), but significantly negatively with domain 3 (social relationships). Among men, being never married (compared to being married) was correlated significantly negatively with Domain 1 (physical health) and Domain 3 (social relationships), and being widowed, separated or divorced was correlated significantly negatively with Domain 3 (social relationships).

Table 2 shows the results of multiple linear regression analyses employing each of the four domains of quality of life as the dependent variable in turn, and entering all the four trauma variables together with age and marital status as independent variables. We found that traumatic life events related to displacement predicted significantly lower quality of life in all the domains for women. In the remaining cases of Table 2, almost all the regression coefficients were negative, and significant for a few.

Models for the effect of trauma on mental distress and quality of life

Correlation matrix of the nine standardized variables comprising the four trauma variables, mental distress, and the four quality of life domains, is given in the Appendix. Mental distress was significantly negatively correlated with quality of life. The partial correlation coefficients (controlling for age and gender) between GSI of SCL-90-R and quality of life were -0.49 ($P < 0.001$) for domain 1, -0.44 ($P < 0.001$) for domain 2, -0.22 ($P < 0.001$) for domain 3,

Table 2 Relationships between each domain of the WHOQOL-BREF, respectively, and the four trauma variables^a

WHOQOL-BREF domains	Mental problems in parents or siblings		Childhood maltreatment		Traumatic childhood life events		Traumatic life events related to displacement	
	Women	Men	Women	Men	Women	Men	Women	Men
Domain 1 (physical health)	-0.133***	-0.071	-0.028	-0.032	-0.024	-0.151**	-0.311***	-0.077
Domain 2 (psychological)	-0.083*	-0.109*	-0.034	-0.056	-0.020	-0.093	-0.278***	-0.092
Domain 3 (social relationships)	-0.054	-0.024	-0.085*	-0.167***	0.035	-0.005	-0.154***	-0.093
Domain 4 (environment)	-0.057	-0.063	-0.041	0.046	-0.033	-0.135**	-0.288***	-0.116*

^a Each WHOQOL-BREF domain was used as the dependent variable in turn in multiple linear regression, where the four trauma variables of the table together with age and marital status were entered as independent variables. The values are standardized regression coefficients

* $P < 0.05$; ** $P < 0.01$; *** $P < 0.001$

and -0.37 ($P < 0.001$) for domain 4. In fact, every dimension of SCL-90-R was significantly negatively correlated with every quality of life domain for each gender (largest $P < 0.003$).

It is of interest to explore the pathways underlying the effects of trauma, leading to an increase in mental distress and a decrease in quality of life. For this we use Structural Equations Modelling by AMOS 6.0 [25] for path analysis. In all the path analyses below, we have controlled (adjusted) for the effects for age and gender, but the paths from them to mental distress and quality of life are not shown in the path diagrams.

We first consider a general (nonrecursive) model where each trauma affects mental distress as well as quality of life directly, and the latter two affect each other:

Model A: Each of the four trauma variables affect both mental distress and quality of life directly and independently; and mental distress and quality of life affect each other (Fig. 2).

The output from analysing this model first yielded path coefficients that were significant for all the paths except for the two paths denoting the effects of childhood maltreatment ($P = 0.061$) and traumatic childhood life events ($P = 0.132$) on quality of life. So the model obtained by excluding these two paths was analysed. The output now showed that two further paths were not significant, the path from mental problems in parents or siblings ($P = 0.686$) to quality of life, and the path from quality of life ($P = 0.991$) to mental distress. The results of analysing the model after excluding also these two paths showed that the remaining paths were all significant ($P < 0.001$ for each), and the modification indices (M.I.) did not suggest inclusion of other paths (M.I. < 4). This obtained model (Model B) is thus an optimum model:

Model B: Each of the four trauma variables affect mental distress, which in its turn effects quality of life, so that

mental distress acts as a mediator. Moreover, traumatic life events related to displacement also have a direct effect on quality of life (Fig. 3).

For the sake of comparison, we also analysed two other reasonable models, one in which mental distress is the mediator for all the effects of trauma on quality of life, and the other in which quality of life is the mediator for all the effects of trauma on mental distress:

Model C: Each of the four trauma variables affect mental distress, which in its turn affects quality of life, so that mental distress acts as a mediator.

Model D: Each of the four trauma variables affect quality of life, which in its turn affects mental distress, so that quality of life acts as a mediator.

Comparisons among these four models with respect to various comparison criteria are given by Table 3. Every criterion for model comparison given in the table suggests that Model B (Fig. 3) gives the best fit to our data compared to the other three models, since it obtained the smallest CMIN/df, the largest AGFI, the largest CFI, the largest NNFI (TLI), the smallest RMSEA, the smallest AIC, and the largest HOELTER(0.5) index. Also, Model B gained three degrees of freedom (df) compared to Model A, but increased only insignificantly in chi-square. All the path coefficients (structural weights), correlations, and factor loadings of Model B (Fig. 3) were significant at level $P < 0.001$, and the four-factor solution for quality of life showed adequate factor loadings. Values of RMSEA below 0.05 are considered to indicate a good fit, and values of CFI and NNFI above 0.95 are considered to indicate a satisfactory fit, which holds for Model B.

The proportion of variance (squared multiple correlation) of quality of life accounted for was obtained as 33% in Model B (gender specific analyses gave 39% for women and 26% for men), 31% in Model C, and 18% in Model D. We also evaluated Model B separately for women and

Fig. 2 Model A: Each of the four trauma variables affect both mental distress and quality of life directly and independently; and mental distress and quality of life affect each other. Controlled for age and gender

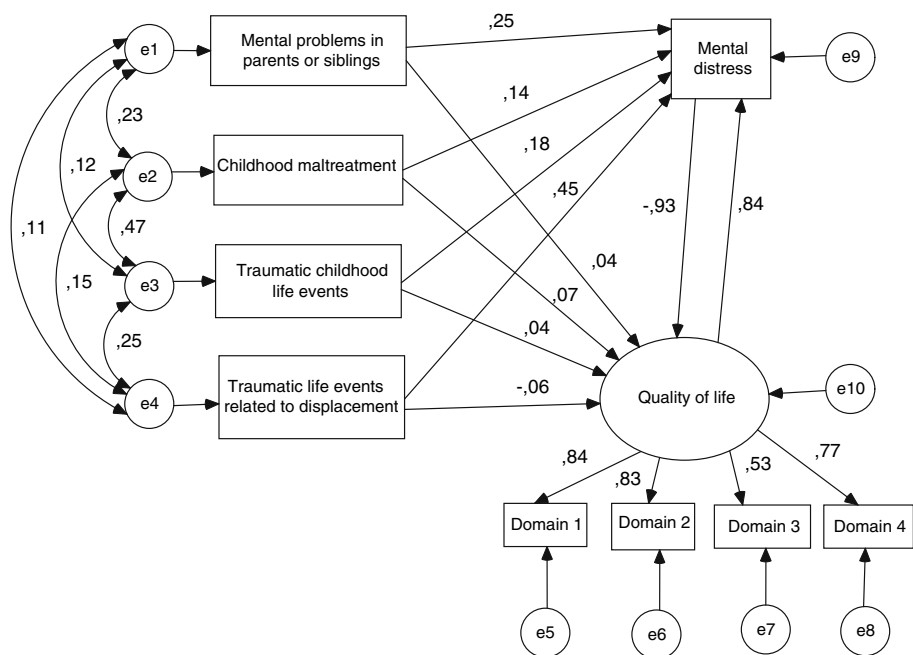
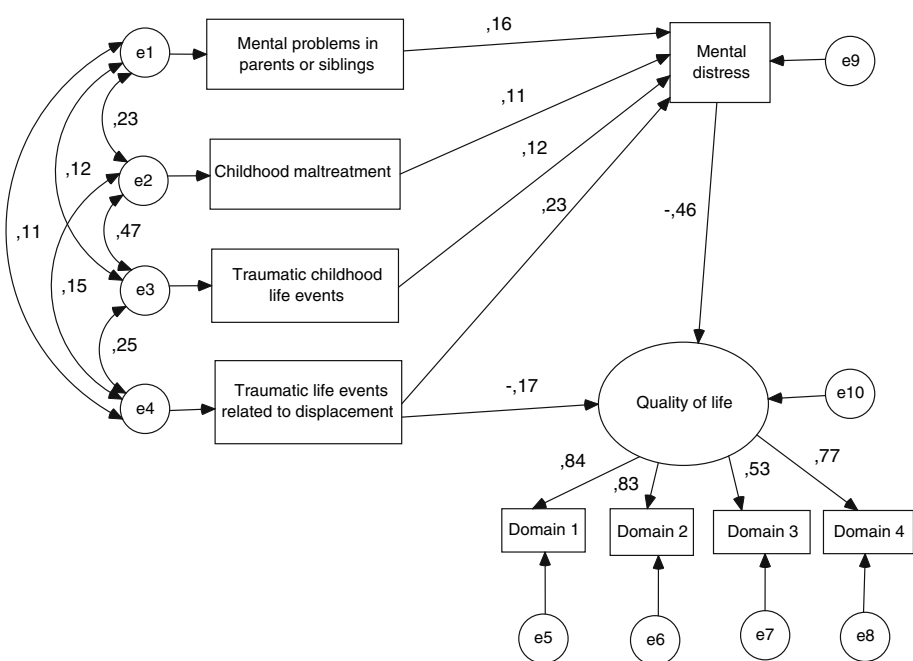


Fig. 3 Model B: Each of the trauma variables effect mental distress, which in its turn effects quality of life, so that mental distress acts as a mediator. Moreover, traumatic life events related to displacement also have a direct effect on the quality of life. Controlled for age and gender. (All the given path coefficients and correlations are significant at level $P < 0.001$)



men, respectively (Table 3). With the exception of the path from traumatic life events related to displacement to quality of life in men, all the paths of Model B for each gender were significant ($P < 0.010$), and modification indices did not suggest inclusion of other paths (M.I. < 4).

The proportion of variance (squared multiple correlation) of mental distress accounted for was obtained as 16% in Model B (gender specific values 18% for women and 15% for men), 16% in Model C and 29% in Model D.

Coping strategies and perceived social support as risk moderators

Controlling for gender and age, perceived social support was not significantly correlated with mental distress ($r = -0.05$, $P = 0.091$), but was significantly positively correlated with average quality of life (mean of the four domains) ($r = 0.37$, $P < 0.001$). Task-oriented coping was not significantly correlated either with mental distress or average quality of life

Table 3 Comparisons among the four models of pathways from trauma to mental distress and quality of life, using various measures of model fit

Model	χ^2 (df)	Change from Model A χ^2 (df)	Change from Model A <i>P</i> value	CMIN/df	AGFI	CFI	NNFI (TLI)	RMSEA	AIC	HOELTER (0.05)
Model A	95.786 (32)			2.99	0.970	0.979	0.964	0.041	163.8	575
Model B	97.569 (35)	1.783 (3)	0.619	2.79	0.972	0.979	0.968	0.039	159.6	608
Model C	135.284 (36)	39.498 (4)	<0.001	3.76	0.963	0.967	0.950	0.048	195.3	449
Model D	192.062 (36)	96.276 (4)	<0.001	5.34	0.948	0.949	0.921	0.060	252.1	317
Model B (Women)	94.266 (27)			3.49	0.948	0.966	0.944	0.058	150.3	316
Model B (Men)	68.893 (27)			2.55	0.938	0.962	0.937	0.059	124.9	262

Model A = Mental distress and quality of life affect each other, and each trauma affects mental distress and quality of life directly (Fig. 2)

Model B = Mental distress is a mediator between all trauma and quality of life, and furthermore, traumatic life events related to displacement affect quality of life directly (Fig. 3)

Model C = Mental distress is a mediator between all trauma and quality of life

Model D = Quality of life is a mediator between all trauma and mental distress

life. Therefore, perceived social support or task-oriented coping cannot be significant mediators between mental distress and quality of life.

Avoidance-oriented coping was significantly negatively correlated with mental distress ($r = -0.09$, $P = 0.002$) and significantly positively correlated with average quality of life ($r = 0.15$, $P < 0.001$). Emotion-oriented coping was significantly positively correlated with mental distress ($r = 0.18$, $P < 0.001$) and significantly negatively correlated with average quality of life ($r = -0.19$, $P < 0.001$). Thus, to investigate if avoidance-oriented coping or emotion-oriented coping played a mediating role between mental distress and quality of life, we added to Model B each of these two coping strategies in turn as a mediator, besides the direct path from mental distress to quality of life. However, the coefficient of the path from mental distress to quality of life changed only to -0.45 in both cases from the value -0.46 in Model B, and the proportion of variance of quality of life accounted for changed from 33% to only 35% in the case of avoidance-oriented coping, and to 34% in the case of emotion-oriented coping. So these coping strategies were not significant mediators.

We investigated the role of coping strategies and perceived social support as risk moderators for the effect of trauma on mental distress, and for the effect of mental distress on quality of life. For this, we added to Model B in turn, a path from each of these coping or support variables together with a path from its interaction term, and used AMOS 6.0 [25] to evaluate the path coefficients. The interaction term was obtained by multiplying the given coping or support variable with mental distress when considering its moderation of quality of life, and multiplying it with traumatic life events related to displacement (trauma) when considering its moderation of mental distress. A significant path from the interaction term would suggest a moderating role of the corresponding coping strategy or perceived social support. Since we had found

gender differences in an earlier study regarding the type of coping strategies employed and in perceived social support [6], we performed gender specific analyses, as reported in Table 4.

The table shows that task-oriented coping had a significant direct beneficial effect in both genders, but through different paths. High task-oriented coping decreased mental distress in women, whereas it increased quality of life in men. The interaction of task-oriented coping with trauma was significant in both genders regarding the effect from trauma to mental distress. Pooling the genders and using median split, we found that when the trauma was high, those with high task-oriented coping had significantly lower mental distress compared to those with low (t -test, 0.21 vs. 0.29 , $P = 0.007$), whereas when the trauma was low, there was no significant difference in the corresponding mental distress values (0.11 vs. 0.12 , $P = 0.80$). With similar analysis for the effect from mental distress to quality of life, when the mental distress was high, those with high task-oriented coping had significantly higher quality of life domains 1 and 2 compared to those with low, but when the mental distress was low, there were no corresponding differences.

Avoidance-oriented coping in women, but not in men, significantly reduced mental distress and increased the quality of life by direct effects. The interaction of avoidance-oriented coping with mental distress was significant in women and had a non-significant trend in the same direction in men. When the mental distress was low, those with high avoidance-oriented coping (genders pooled) had significantly higher average quality of life compared to those with low (12.0 vs. 11.2 , $P < 0.001$), but when the mental distress was high, there was no corresponding significant difference (10.6 vs. 10.2 , $P = 0.056$).

Emotion-oriented coping in women had direct effects on increasing mental distress and reducing quality of life. Social support did not effect mental distress directly or

Table 4 Direct and moderating roles of coping strategies and perceived social support for the effect of traumatic life events related to displacement (trauma) on mental distress, and for the effect of mental distress on quality of life

Risk moderator	Women (Standardized path coefficient)	Men (Standardized path coefficient)
<i>On the effect from trauma to mental distress:</i>		
Task-oriented coping	-0.093**	-0.071
Task-oriented coping × trauma	-0.074*	-0.085*
Avoidance-oriented coping	-0.104**	-0.050
Avoidance-oriented coping × trauma	-0.049	-0.010
Emotion-oriented coping	0.108***	0.082
Emotion-oriented coping × trauma	0.005	0.088*
Perceived social support	-0.013	-0.039
Perceived social support × trauma	-0.016	-0.059
<i>On the effect from mental distress to quality of life:</i>		
Task-oriented coping	-0.063	0.112**
Task-oriented coping × mental distress	-0.031	-0.137***
Avoidance-oriented coping	0.149***	0.061
Avoidance-oriented coping × mental distress	-0.096**	-0.072
Emotion-oriented coping	-0.131***	-0.041
Emotion-oriented coping × mental distress	0.027	0.071
Perceived social support	0.275***	0.437***
Perceived social support × mental distress	-0.017	-0.066

* $P < 0.05$; ** $P < 0.01$; *** $P < 0.001$

indirectly. However, higher social support directly increased the quality of life significantly in both genders.

Quality of life in relation to self-reported living conditions

Table 5 gives the partial correlation coefficients between each domain of quality of life and each of the indicators of the subject's living conditions, when controlling for the effects of mental distress and traumatic life events related to displacement as well as age, gender and marital status. As seen in the table, lack of food and water, lack of support from the organizations, or lack of good health were all associated with lower quality of life in essentially all domains. Domain 1 (physical) was further associated positively with the availability of toilets or latrines but negatively with loss of general benefits. Domain 2 (psychological) was associated positively with availability of private facilities but negatively with accommodation too cramped. Domain 3 (social relationships) was associated negatively with accommodation too cramped. Domain 4 (environment) was further associated positively with the availability of beds or mattress, toilets or latrines and protection against animals and insects, but negatively with loss of general benefits.

The table also shows that a large proportion of the subjects report that the accommodation was too cramped and that they had lost general benefits during the past year.

Only a small minority had a bed or mattress, private facilities, sufficient food and water, protection against animals and insects, or enough support from the organizations. About 59%, however, considered their health to be good or very good.

Table 5 also gives the partial correlations of quality of life with mental distress and traumatic life events related to displacement, after controlling for the living conditions. These correlations are all significantly negative.

Discussion

A general discussion on the gender-specific sociodemographic conditions and trauma background as well as coping and social support evaluated for these subjects, is reported elsewhere [6]. We have found that traumatic life events related to displacement were reported to be considerably higher and more important than trauma before the displacement conditions. This is also reflected by the optimum Model B (Fig. 3)—of the paths from each of the four trauma variables to quality of life, only the one from traumatic life events related to displacement was significant.

Women had higher GSI levels of the mental distress instrument SCL-90-R compared to men, as has been found in many other studies [13–15]. However, we found that among women, the GSI increased significantly with age, in

Table 5 Relationships between quality of life and living conditions, mental distress, and traumatic life events related to displacement

	% with Yes	Quality of life			
		Domain 1 (physical)	Domain 2 (psychological)	Domain 3 (social relations)	Domain 3 (environment)
<i>Self-reported indicators of living conditions^a</i>					
Is your accommodation too cramped?	64.8	-0.056	-0.059*	-0.107***	0.010
Is there a bed/mat/mattress available?	17.6	0.052	0.060*	0.021	0.091**
Are there private facilities or private places?	5.6	0.014	0.075**	0.002	0.025
Are there toilets/latrines?	31.2	0.058*	0.026	-0.037	0.166***
Is there sufficient food/water?	16.3	0.127***	0.107***	0.060*	0.169***
Do you have protection against animals/insects?	8.7	0.053	0.057	0.019	0.064*
Is the support from the organizations enough for you?	10.9	0.142***	0.100***	0.053	0.193***
Is your health good or very good during your stay?	58.8	0.312***	0.164***	0.089**	0.239***
During the last year, have you experienced loss of general benefits?	75.3	-0.068*	-0.026	-0.035	-0.102**
<i>Mental distress and trauma^b</i>					
GSI (global severity index) of the SCL-90-R		-0.398***	-0.371***	-0.137***	-0.275***
Traumatic life events related to displacement		-0.150***	-0.149***	-0.074*	-0.169***

^a The table gives partial correlation coefficients after controlling for age, gender, marital status, mental distress and traumatic life events related to displacement

^b The table gives partial correlation coefficients after controlling for age, gender, marital status, and the self-reported indicators of living conditions

* $P < 0.05$; ** $P < 0.01$; *** $P < 0.001$

contrast to a decrease with age found in general population studies in the west [13–15]. This suggests that the very poor living conditions existing in the shelters are experienced as still harder by the older women, likely due to deteriorating physical and mental abilities with age and lack of support for the elderly that otherwise prevails in general populations. This is further reflected by our result that essentially each domain of quality of life decreased significantly with age in both genders.

Among men, the status of being married was associated with a higher quality of life in some domain, as compared to being never married, widowed, separated or divorced. This result is in line with the literature. Among women, the quality of life when being widowed, separated or divorced, was not significantly different compared to being married, although for the never married it was associated with significantly lower domain 3 (social relationships).

However, surprisingly, we found that never married women had a significantly higher quality of life in the other three domains (physical health, psychological, environment) compared to being married. A possible reason for this could be that women in the married case have a larger responsibility to cater for the family and the husband, and thereby sacrifice some quality of life in these domains.

Traumatic life events related to displacement were associated with lower quality of life in women, even after

controlling for the mediation effect by mental distress in path analysis.

Mental distress as a mediator between trauma and quality of life

We found that Model B (Fig. 3) gave a good fit, and was the best fit among the models considered. Each of the three measures of childhood trauma as well as trauma during displacement was associated with increased mental distress in the subjects. Mental distress was a mediator for the effects of trauma on quality of life—trauma increased mental distress, which in its turn decreased the quality of life. Trauma during displacement decreased quality of life also directly, particularly in women. Measures of mental distress and quality of life have earlier been employed simultaneously in some studies, but these have only been analysed individually in group comparisons without any investigation of the mediating or moderating roles of the variables [16, 17, 27].

There is a conceptual difference between the psychological domain (domain 2) of the quality of life instrument WHOQOL-BREF, and the instrument SCL-90-R employed to measure mental distress. Whereas the latter instrument probes into 90 specific questions to measure the severity of distressing symptoms covering a wide spectrum of mental

disorders, the former instrument essentially captures how the subject enjoys life or finds life meaningful and satisfactory. Only one of the six items of the psychological domain of quality of life is an open question about how often the subject has negative feelings such as blue mood, despair, anxiety or depression.

Also, a conceptual difference between the physical health domain (domain 1) of WHOQOL-BREF and the somatization (SOM) dimension of SCL-90-R is worth noting. The former asks about the how the subject's physical health prevents him or her from performing the activities of daily living and how much medical treatment is needed, whereas the latter asks about the occurrence of symptoms like pain, nausea, trouble getting breath, numbness or tingling in parts of the body—symptoms that are often associated with the masked forms anxiety and depression.

Perceived social support

Perceived social support was not associated with mental distress in our study. This implies that perceived social support did not act as a mediator for the effects of trauma on mental distress. A study on torture survivors in Nepal [28] also found that perceived social support was not related to mental distress, although they found a relationship between “received” social support and mental distress. Punamäki et al [18] found that among traumatized Palestinians, “received” social support was a mediator between trauma and mental distress. A study in postwar Kosovo found that higher social support was associated with lower posttraumatic stress scores [29]. Among resettled Sudanese refugees in Australia, perceived social support from their ethnic community, but not from the wider community, was related to lower mental distress [30].

In our study, although perceived social support was not related to mental distress, it was associated with higher quality of life instead. We did not find any significant interaction between social support and trauma. However, Kaspersen et al [31] found such an interaction; social support had a beneficial effect for UN soldiers with low but not high trauma exposure, and for relief workers with high but not low trauma exposure. So it is likely that the significance of perceived social support is different for different post-trauma circumstances or for different cultural contexts, and the results may also vary depending on how the elements of social support were measured.

Coping strategies

Task-oriented coping was found to be beneficial, by reducing mental distress in women and by increasing quality of life in men. Its moderating role for the effect of

mental distress on quality of life was beneficial particularly when high mental distress was present. Task-oriented coping has been shown to be of benefit (and emotion-oriented coping has been shown to be detrimental) in the context of mental distress and psychopathology in several studies [21, 32, 33]. Gender differences in the use of coping behaviour have been known [21–23], such that women score higher on emotion-oriented and avoidance-oriented coping, and men score higher on task-oriented coping. However, the gender specific difference we found regarding the influence of task-oriented coping on mental distress compared to on quality of life has, not been reported earlier.

We found avoidance-oriented coping to be beneficial in women by reducing mental distress and increasing quality of life. Its moderating role was particularly beneficial when mental distress was low. Emotion-oriented coping was in our study related to higher mental distress and lower quality of life in women, consistent with the literature.

Living conditions

Living conditions in the shelters, like the availability of food and water, sleeping comforts, latrines, and support and benefits from the helping organizations, were associated with higher quality of life in several domains, even after controlling for the effects of mental distress and traumatic life events related to displacement. Mental distress and trauma, on the other hand, were significantly associated with lower quality of life in all domains, even after controlling for the living conditions. In fact, these latter correlations were stronger than those obtained for the living conditions. This suggests that intervention strategies should include both psychosocial and psychiatric help as well as help to improve the material living conditions, since both were beneficial on their own.

Conclusions

Our study shows that traumatic life events related to displacement are significantly associated with higher mental distress and lower quality of life.

Elucidating the complex pathways involved in the effects of severe trauma on the life of the victims as we have done, by identifying mediators, moderators and independent risk factors [9, 10], is likely to facilitate the implementation of rehabilitation and intervention strategies. Strategies aimed at reducing mental distress in the subjects are likely to lead to a better overall quality of life as a consequence. These are valuable complements to strategies that focus on improving the quality of life by

improving the material living conditions, since the goal should be to facilitate overall resilience and to heal the psychological wounds as well.

Strategies that help modify the coping strategies are also likely to be of benefit; the focus suggested by our results is to reduce emotion-oriented coping and increase task-oriented coping. Avoidance-oriented coping, instead of emotion-oriented coping, is also likely to be beneficial at least in the shorter time perspective. The subjects are likely to benefit from changes in the organization structure of the shelters that promote the appropriate modification of the coping strategies and also encourage increased social support.

A limitation of the study is that all the information was obtained through interviews with the subjects, so the various instruments are based on self-report measures. This is also true of the trauma measures as well as measures of coping strategies and social support, and of the living conditions.

A second limitation of this study is that this was not a prospective study. Prospective studies enable a temporal

cause to effect understanding. In our study, however, information was collected in a cross-sectional manner during the interviews, and we had no possibility to verify the information recalled by the individual.

A third limitation is that although statistically significant relationships have been obtained, they do not necessarily imply that the relationships are high in magnitude. As the Appendix shows, the correlations were of medium size (0.3–0.5) between mental distress and quality of life, and of small size (0.1–0.3) between trauma variables and mental distress. However, it is worth noting that the correlations between self-reported living conditions and quality of life (Table 5) were also of small size.

Fourthly, the subjects fled like refugees after a long civil war but ended up as internally displaced persons. This may call for caution in comparing our results with studies on persons who may have gone through similar trauma, but end up as refugees outside their home countries, particularly in the developed countries.

Appendix Correlation matrix of the standardized observed endogenous variables employed in the path analysis

	1.	2.	3.	4.	5.	6.	7.	8.	9.
1. Mental problems in parents or siblings	1.00								
2. Childhood maltreatment	0.25	1.00							
3. Traumatic childhood life events	0.15	0.44	1.00						
4. Traumatic life events related to displacement	0.14	0.18	0.31	1.00					
5. Mental distress	0.20	0.22	0.18	0.23	1.00				
6. Quality of life domain 1 (physical)	-0.11	-0.09	-0.08	-0.18	-0.49	1.00			
7. Quality of life domain 2 (psychological)	-0.10	-0.10	-0.08	-0.18	-0.44	0.70	1.00		
8. Quality of life domain 3 (social)	0.01	-0.07	0.06	0.03	-0.22	0.47	0.49	1.00	
9. Quality of life domain 4 (environment)	-0.06	-0.05	-0.06	-0.16	-0.37	0.68	0.65	0.47	1.00

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