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POST TRAUMATIC STRESS DISORDER AMONG MAU MAU CONCENTRATION CAMP SURVIVORS IN KENYA
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ABSTRACT

Background: A decade before Kenya's independence in 1963 thousands of 'Mau Mau' fighters were arrested and incarcerated in concentration camps where many underwent torture and inhuman treatment. No studies have been done to establish the presence of post traumatic stress disorder (PTSD) and other psychiatric morbidity among the survivors of those concentration camps.

Objectives: To establish the prevalence of PTSD and other psychiatric morbidity and associated factors among the Mau Mau Concentration Camp survivors.

Design: A cross-sectional, descriptive study of all consecutive concentration camp survivors included in the study.

Setting: Mau Mau War Veterans' Association (MMWVA) headquarters at Mwea House, Nairobi, Kenya Human Rights Commission headquarters in Nairobi, Tumaini House (Venue of MMWVA elections, 2005) and the MMWVA branch office in Kajiado District, Rift Valley Province, Kenya.

Subjects: One hundred and eighty one Mau Mau Concentration Camp Survivors who gave consent to participate in the study.

Main outcome measures: Lifetime and Current PTSD, IES-R score and other Psychiatric Morbidity as measured using the SCID and the IES-R.

Results: A DSM-IV-TR diagnosis of current PTSD was made in 65.7% of the survivors. Current PTSD was associated with higher IES-R scores and older age, lower income, non-Catholic religion, larger household size, older age at incarceration, greater length of incarceration, incarceration in two or more camps, experiencing other traumatic events, family history of mental illness and having other psychiatric illness.

Conclusions: Similar to other former Prisoners of War (POWs) elsewhere, these survivors suffer high PTSD prevalence rates and a special veterans' service is recommended to address this problem and its associated factors among these and other veterans in Kenya.

INTRODUCTION

In the last decade before Kenya's independence in 1963, an armed uprising resulted in the arrest and incarceration of tens of thousands of suspected 'Mau Mau' fighters in concentration camps. According to official sources, by the end of 1956 over 11,000

suspected Mau Mau had been killed, with 30,000 being detained (1). Physical and psychological abuse was common in most camps, as demonstrated at the Hola Camp, where on 3rd March 1959 eighty-five detainees were forced to a work site and assaulted with truncheons, leading to the deaths of eleven inmates (2). Post traumatic stress disorder (PTSD)

among former Prisoners of War (POWs) has been described in many studies among western populations (3-5), with little or no comparative information coming from non-western populations. This study attempted to compare the results from this non-western former POW sample with those from western populations.

MATERIALS AND METHODS

Subjects and setting: Due to the absence of a database of survivors of the concentration camps, consecutive sampling of all the survivors encountered during meetings of a newly-formed Mau Mau War Veterans' Association (MMWVA) was carried out between July and October 2005. A total of 181 survivors were interviewed at four sites- Mwea House (MMWVA headquarters), Kenya Human Rights Commission (KHRC) headquarters, Tumaini House (during the MMWVA elections) all in Nairobi area, and the Kajiado MMWVA offices in the Rift Valley Province of Kenya. Slightly over half (52.5%) of the subjects were male. The age ranged from 58 to 97 years, with a mean of 76 years (S.D. 9).

Instruments: A socio-demographic and traumatic events questionnaire was designed by the researchers and it included questions on age, gender, marital status, annual income, residence, religion, highest education level, household size, age at incarceration, length of incarceration, number of camps one was held in, injuries sustained (major-requiring hospitalisation, Minor- not requiring hospitalisation), ceremonies conducted after detention, past history of mental illness, family history of mental illness and experience of other traumatic events. On the same questionnaire, the presence of PTSD symptoms and other psychiatric morbidity (as determined using the SCID) and the IES-R total score (from the IES-R questionnaire) were recorded.

The SCID (6) is based on DSM-IV diagnostic criteria and has been used in various settings to detect PTSD and other psychiatric illnesses in population samples and in help-seeking individuals. It is a semi-structured diagnostic interview designed to assist clinicians, researchers and trainees in making reliable DSM-IV psychiatric diagnoses. Many studies have been carried out to assess the reliability and validity of this instrument and these

can be found at the 'SCID web page': <http://cumc.columbia.edu/dept/scid/>.

The IES-R is a 22-item questionnaire inquiring about an individual's distress due to symptoms related to PTSD over a seven-day period. The response for each item is scored on a scale of 0-4 (0=No distress, 1 = A little bit of distress, 2=Moderate distress, 3=Quite a bit of distress, and 4=Extreme distress). The minimum total score is 0 and the maximum total score is 88. For the purposes of assessing overall distress in this study, the total score was divided by the number of items (22) to get a mean overall score which was then interpreted using the Likert scale described above.

Procedure: Ethical and administrative review of the study proposal was done by the Department of Psychiatry at the University of Nairobi, the Kenyatta National Hospital Ethics Review Committee and the Ministry of Education, Science and Technology. Written informed consent was obtained from all the subjects involved in the study, by means of a signature or other mark on the informed consent form.

The researcher-designed socio-demographic questionnaire, the IES-R and the SCID were then administered to the consenting subjects consecutively until the sample size of 181 was reached over a period of four months (July-October 2005). No identifying information like names or exact place of residence was collected. All subjects found to be suffering from any illness were referred to the nearest health facility for appropriate care.

Analysis: Collected data was analysed using the Statistical Package for Social Sciences (SPSS version 12.0 for Windows, ©SPSS Inc., 1989-2003). Data transformations done after data collection for purposes of analysis included recoding into fewer categories (marital status and education level), coding uncoded variables (religion and other psychiatric morbidity) and banding of continuous variables into categories (annual income, household size, age at incarceration, length of incarceration number of camps and IES-R scores). Residence was analysed by district of residence, and not where the interview took place. Analysis done on the data included binomial test for the hypothesis, independent samples t-test for numeric variables and chi squared (X^2) test for association of categorical variables with current PTSD. Results were

considered to be statistically significant when $p < 0.05$. Where appropriate, relative risk (RR) was calculated to estimate the strength of association between various factors and PTSD.

RESULTS

Description of the sample: The sample consisted of 181 subjects aged between 58 and 97 years, with a mean age of 76 years (S.D. 9). The subjects were resident in Kajiado district of the Rift Valley Province (33.1%), Mount Kenya region (33.1%) and Nairobi area (23.8%). Ninety five (52.5%) of the subjects were male (male to female ratio 1.1:1) and 48.6% were married at the time of the study. Annual incomes (in Kenya shillings, KES) ranged from 0 to KES 240000 (mean 26,528, S.D. 52,096, median 6,000; 1 USD = 75 KES), and majority of the subjects (78.5%) earned less than KES 30,000 per annum. Household size ranged from 1 to 14 (mean 5.17, S.D. 3.207, median 5) and 14.4% of the subjects lived alone at the time of the study. A significant proportion of the subjects (42.5%) were Catholic, with the rest being mostly protestant. Only four of the subjects were Muslim. Most of the subjects (58%) had received no formal education.

Age at incarceration ranged from 7 to 45 years (mean 23.74, S.D. 9.028, median 22) with a large proportion (42%) having been incarcerated before

adulthood. Length of incarceration ranged between 1 and 96 months (mean 39.04, S.D. 31.312, median 42) and just over one third (34.8%) had been incarcerated for one year or less. The number of camps each subject was held in was between one and nine (mean 2.83, S.D. 2.183, median 2) with 58.6% having been held in two or more camps.

About a third (34.3%) of the subjects had sustained major injuries (requiring hospital admission for treatment) during their incarceration. Fifteen subjects (8.3%) reported having been treated for mental illness in the past, while 26 (14.4%) had family history of mental illness. Twenty two subjects (12.2%) reported having experienced other traumatic events after their incarceration, and none of the subjects reported having had any ceremonies or functions to assist them reintegrate into society following their incarceration.

Prevalence of PTSD: One hundred and thirty-two (72.9%) subjects had lifetime PTSD while 119 (65.7%) had current PTSD. The mean age of those with current PTSD (76.8 years, S.D. 8.7) was significantly higher than for those without PTSD (73.1 years, S.D. 9.5) ($t = 2.648, p = 0.009$).

Table 1 shows the relationship between current PTSD and various variables.

Table 1

Current PTSD and various variables

Variables/Current PTSD	Yes	(%)	No	(%)	$X^2, df = 1$	P	RR (95% CI)
Gender							
Male	60	50.4	35	56.5	0.595	0.441	Not significant
Female	59	49.6	27	43.5			
Marital status							
Currently married	58	48.7	30	48.4	0.002	0.964	Not significant
Currently not married	61	51.3	32	51.6			
Annual income							
<30,000	101	84.9	41	66.1	8.473	0.004*	1.541 (1.081-2.197)
30,000+	18	15.1	21	33.9			
Religion							
Non-Catholic	78	65.5	26	41.9	9.296	0.002*	1.409 (1.111-1.785)
Catholic	41	34.5	36	58.1			

Table 1 (continued)

Variables/Current PTSD	Yes	(%)	No	(%)	X ² , df = 1	P	RR (95% CI)
Education							
None	71	59.7	34	54.8	0.390	0.533	Not significant
Some	48	40.3	28	45.2			
Household size							
Lives with others	110	92.4	45	72.6	13.065	<0.001*	2.050 (1.197-3.510)
Lives alone	9	7.6	17	27.4			
Incarceration age							
Adult	78	65.5	27	43.5	8.098	0.004*	1.377 (1.087-1.744)
Not adult	41	34.5	35	56.5			
Incarceration length							
Over one year	90	75.6	28	45.2	16.677	<0.001*	1.657 (1.245-2.205)
One year or less	29	24.4	34	54.8			
Number of camps							
Two or more camps	85	71.4	21	33.9	23.694	<0.001*	1.769 (1.356-2.308)
One camp	34	28.6	41	66.1			
Injuries sustained							
Major	43	36.1	19	30.6	0.545	0.460	Not significant
Minor	76	63.9	43	69.4			
Past mental illness							
Yes	8	6.7	7	11.3	1.119	0.290	Not significant
No	111	93.3	55	88.7			
Family mental illness							
Yes	26	21.8	0	0	15.818	<0.001*	1.667 (1.466-1.895)
No	93	78.2	62	100			
Other trauma							
Yes	19	16.0	3	4.8	4.727	0.030*	1.373 (1.119-1.685)
No	100	84.0	59	95.2			

* Statistically significant; X² = Chi Squared statistic; P = significance level; RR = Relative Risk; CI = Confidence Interval; df = degrees of freedom.

There was no statistically significant association ($p > 0.05$) between current PTSD and gender, marital status, level of education, injuries sustained and past history of mental illness.

As shown in Table 1, a majority of those with PTSD (84.9%) had incomes less than Kshs 30,000, while among those with no PTSD 66.1% had incomes less than Kshs 30,000, showing a statistically significant difference ($X^2 = 8.473$, $p = 0.004$).

Majority of the subjects with PTSD were non-Catholic compared to those without PTSD (65.5% vs. 41.9%, $X^2 = 9.296$, $p = 0.002$), and the difference was statistically significant.

A higher proportion of those with PTSD (92.4%) lived with others, compared with 72.6% of those without PTSD. The difference was statistically significant ($X^2 = 13.065$, $p < 0.001$).

Seventy eight (65.5%) of those with PTSD were captured as adults (above 19 years), while 27 (43.5%) of those with no PTSD were adults at the time of incarceration. The difference was statistically significant ($X^2 = 8.098$, $p = 0.004$).

Most (75.6%) of those with PTSD had been incarcerated for over one year, while most (54.8%) of those without PTSD had been incarcerated for one year or less. This difference was statistically significant ($X^2 = 16.677$, $p < 0.001$).

Table 2
Presence of other psychiatric disorders versus current PTSD

PTSD/Other PM	Present		Absent		Total	
	No.	(%)	No.	(%)	No.	(%)
Yes (%)	63	52.9	56	47.1	119	(100)
No (%)	8	12.9	54	87.1	62	(100)
Total (%)	71	39.2	110	60.8	181	(100)

$X^2 = 27.410$, $df = 1$, $p < 0.001$, $RR = 1.743$ (1.425-2.132)

As shown in Table 1, majority (71.4%) of those with PTSD had passed through two or more camps, compared with only 33.9% of those without PTSD. This difference was statistically significant ($X^2=23.694$, $p < 0.001$).

None of those without current PTSD had family history of mental illness, while 26(21.8%) of those with current PTSD had positive family history of mental illness. The difference was statistically significant ($X^2=15.818$, $p < 0.001$). Nineteen (16%) of those with current PTSD reported having had other traumatic events subsequent to their release from incarceration, while only three of those without PTSD reported similar events. This difference was statistically significant ($X^2=4.727$ $p=0.03$).

Co-morbidity: Table 2 shows the summarised co-morbidity data. Sixty three (52.9%) of those with current PTSD (No=119) had a comorbid Axis I disorder, with the most common being major depressive disorder (43.7%), followed by alcohol dependence (6.7%) and specific phobia (2.5%). The rest (47.1%) had no other psychiatric morbidity.

IES-R Score: The mean total IES-R score was statistically significantly higher among those who had PTSD (76.47, S.D. 8.10) than among those who had no PTSD (34.66, S.D. 20.89), ($t=15.177$, $p < 0.001$). This translates to a mean score (on the scale 0-4, as described in "Method" section above) of 76.47/22 or 3.48 (Quite a bit to Extreme distress) for those with PTSD and 34.66/22, or 1.58 (None to a little bit of distress) for those without PTSD.

DISCUSSION

Study population: This study population is unique in being an aged group of former POWs in an African setting. No studies are available among this type of

population, and this is one of the few studies in that area. A second key feature is the male to female ratio, which approaches 1:1. This differs with most other studies even in western populations, where there is very little information concerning female POWs and any psychiatric morbidity among them.

A matter of particular interest in this population is the significant proportion without formal education. Most of the survivors either dropped out of school to join the independence struggle or did not have the opportunity to attend formal educational institutions prior to their incarceration. In spite of their apparent low educational status, most of the survivors could communicate adequately in English or Kiswahili, the official languages in Kenya. The large number of children and adolescents incarcerated (42%) is significant since it reflects the large number of child and adolescent combatants who served in this conflict. Their development and any possible achievements they may have had if they had not been arrested were disrupted by their involvement in the war and later incarceration.

PTSD prevalence: This study found a lifetime PTSD prevalence rate of 72.9% and a current PTSD level of 65.7%. A review by De Girolamo and McFarlane (4) reported that PTSD prevalence rates in the majority of Prisoners of War (POWs) studies was over 50%, going as high as .70% or more in some studies. Incidence of PTSD symptoms for the first time decades after imprisonment and chronicity of the symptoms is also reported in most studies. Engdahl and colleagues (3) studied POWs from World War II and the Korean conflict upto 50 years later and found PTSD rates of 29% with a lifetime prevalence of 53%. The most severely traumatised group (POWs held by the Japanese) had PTSD lifetime rates of 84% and current rates of 59%.

Another study (5) followed up a similar cohort of POWs for four years and found current PTSD rates at the beginning of the study of 2.7% and 34% at the second assessment four years later, concluding that PTSD symptom levels increase in older survivors of trauma after a significant decline in the years after the traumatic events. Differences in PTSD rates in studies of similar cohorts (sometimes using the same data) have been explained to be due to inter alia, the use of different sampling methods, criteria for diagnosing the disorder, timing of the investigation, degree of exposure, as well as use of different instruments with varying sensitivity (4).

Comparing the prevalence rate of current PTSD with that found in the other studies of POWs as cited above, this study has demonstrated a significantly higher prevalence rate than all the other studies. The current PTSD prevalence rate found in this study is even significantly higher ($p < 0.05$) than that reported among American prisoners of war held in Japan during World War II (59%), a cohort thought to have been more traumatised than other POWs (3). The higher prevalence rate may be assumed to be due to the dehumanising subjective experience of the custody by the detainees in the camps, since other studies have demonstrated a direct link between degree of negative subjective appraisal of trauma and later development of PTSD (7, 8).

Subjects suffering from PTSD had very high IES-R scores, indicating that they experienced severe distress due to the PTSD symptoms. The following factors also showed statistically significant association with current PTSD:

- (i) Older age ($t = 2.648$, $p < 0.05$)
- (ii) Lower annual income ($< \text{KES } 30,000$, RR 1.54 1)
- (iii) Non-Catholic religion (RR 1.409)
- (iv) Living with others (RR 2.050)
- (v) Adult at incarceration (RR 1.3.77)
- (vi) Incarceration over one year (RR 1.65.7)
- (vii) Incarceration in two or more camps (RR 1.769)
- (viii) Family history of mental illness (RR 1.667)
- (ix) Experiencing other traumatic events after incarceration (RR 1.373)
- (x) Presence of comorbid Axis I disorders (RR 1.743)

Association of current PTSD with age finds mixed support in literature suggesting that PTSD occurs more commonly among the elderly and young

adults (8). This must however be interpreted with caution because of the narrow age range in this population (58-97 years), which lumps most of the subjects in the same age category compared with the general population.

Catholic religion seems to be a protective factor, a finding that seems to be in agreement with a similar effect in relation to suicides (9). The review by Friedman and Marsella (7), also found that religion and cultural beliefs may differentially influence the meaning and subjective experience of trauma.

Contrary to other studies that suggest that a larger social support network and community support is protective against PTSD (7, 10), this study found a significant association between larger household size and current PTSD. This may be because those with PTSD had higher levels of distress and needed more help from relatives than those without PTSD.

The association of current PTSD with income, length of incarceration, number of camps, family history of mental illness, multiple traumatic events and presence of other psychiatric morbidity is consistent with findings in other studies that showed an association between PTSD and lower income or socioeconomic status, proximity, severity and duration of trauma, family and personal history of mental illness as well repeated traumatisation (7,8,10,11).

The association of current PTSD with older age at incarceration, when considered against the fact that adults at incarceration in this population referred to young adults aged between 19 years and 45 years (mean 24 years), is in agreement with the review by Staab and colleagues (11) that found that being a young adult at the time of traumatisation was a risk factor for development of PTSD.

Significantly, this study found no association between current PTSD and gender, current marital status and level of education, factors which have consistently been reported by other studies as having an association.

The high degree of trauma resulting in very high rates of PTSD may have overshadowed any possible effect of gender on current PTSD, given the fact that all detainees were considered to be dangerous insurgents and were treated as such, regardless of their gender.

Current marital status in this population may not have been a good measure of family stability given the possibility that many who had been widowed or divorced could have remarried, thus making any comparisons with those who were single at the time of the study difficult. At the time of incarceration, a large proportion of the detainees were too young to have married.

The generally low levels of education in the entire study population may have contributed to the lack of difference in distribution of Current PTSD among those with some formal education and those without. Most Africans during the colonial era had little opportunity for formal education, and the few schoolgoing detainees had had to interrupt their studies during the state of emergency. Further studies may be necessary to study these factors in more detail.

Other factors showing no significant association with Current PTSD were the magnitude of injuries sustained and past history of mental illness.

Subjective assessment of severity of injury has become accepted as the predictor of PTSD rather than the objectively measured extent of injury, though some studies still find presence of injury to be a risk factor for PTSD (12, 13). Body injury may increase one's perception of the severity of the traumatic event, but may not on its own predict later occurrence of PTSD. This may have contributed to the lack of association between objectively measured severity of injury (need for hospitalisation) and current PTSD in this study.

The small number of subjects reporting past mental illness may explain the absence of association between this factor and current PTSD as reported in other studies (8, 10, 11).

Limitations: A major limitation of this study is the use of consecutive sampling rather than randomisation. This was done due to lack of information concerning the total number or location of surviving detainees. The methodology may preclude making any generalisations of results to other veterans not considered in this study, and after completion of registration of veterans by the responsible bodies it may be necessary to conduct a larger study using a randomised sample selection in order to confirm the findings in the present study.

This study was conducted at a period when debate on compensation of Mau Mau veterans was

going on in the mass media, both local and international. This may have raised the expectation among the study subjects that positive responses would directly influence their case for compensation. In order to reduce the bias engendered by this expectation, it was explained to them from the outset that this study was not related to the compensation issue.

This study was examining effects of events that occurred more than fifty years ago. Due to the advanced age of the veterans, it was anticipated that recall difficulties would arise concerning the specific nature of traumatic events and circumstances surrounding them. The effect of this recall problem was however minimal as it did not affect assessment for current PTSD symptoms.

In conclusion, this study demonstrated a very high prevalence rate of current PTSD with significant distress in an African population of former POWs. Better screening of these survivors and other war veterans of armed service is necessary in order to diagnose and manage any psychiatric and other health problems they may have. There being no system in place to assess and manage the psychological and physical health of these veterans, it is imperative that there be established a special Veterans' Service to address these issues. Further studies are also necessary, with larger sample sizes and better methodologies, to confirm the findings in this study and plan interventions to improve the health and socioeconomic situation of veterans.

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