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Trauma, Healthcare Access, and Health Outcomes among Southeast Asian Refugees in Connecticut

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Abstract

Objective—Mental health problems among Southeast Asian refugees have been documented. However, longer term health consequences of mass violence as re-settled refugees age are less well described. This study investigated relationships among trauma symptoms, self-reported health outcomes, and barriers to healthcare among Cambodian and Vietnamese persons in Connecticut.

Methods—An internet phone directory was used to generate a list of names that was compared to 2000 census data to estimate the proportion of the population in each group. From these lists, 190 telephone listings were selected at random. Interviewers telephoned selected listings to screen for eligible participants and obtain an appointment for interview. Surveys were administered through face-to-face interviews during home visits conducted in Khmer or Vietnamese. The Harvard Trauma Questionnaire assessed trauma symptoms. Questions regarding the presence of physician diagnosed heart disease, hypertension, diabetes, and chronic pain were adapted as written from the Health Interview Survey. Healthcare access and occurrence were measured with questions regarding cost and access, patient-provider understanding, and interpretive services. Hierarchical modeling was used to account for respondent nesting within family. Analyses controlled for age, sex, and country of origin.

Results—Individuals who reported greater trauma symptoms were more likely to report heart disease by a factor of 1.82, hypertension by a factor of 1.41, and total count of diseases by a factor of 1.22, as well as lower levels of subjective health. Greater trauma symptoms were also

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associated with greater lack of understanding, cost and access problems, and the need for an interpreter.

Conclusions—Although the majority of Southeast Asian immigrants came to the United States as refugees approximately 20–30 years ago, there continues to be high levels of trauma symptoms among this population which are associated with increased risk for disease and decreased access to healthcare services.

Keywords

refugee; southeast asian; trauma; ptsd; disease

INTRODUCTION

The majority of people living in Connecticut who originate from the Southeast Asian countries of Cambodia and Vietnam came to the United States as refugees from the US war in Southeast Asia. Following the withdrawal of US forces in 1975, each of these countries continued to suffer the effects of the conflict. In Cambodia, for example, the Khmer Rouge actively murdered hundreds of thousands of citizens and two million more died from starvation, trauma and disease between 1975 and 1979. Vietnamese refugees in the US brought a similar set of problems, following 20 years of warfare and “re-education”.

The physical health of these communities is seriously compromised. The most common physical problems of newly settled refugees include musculoskeletal and pain issues, infectious diseases, and for those who endured torture, scars from intentional wounding (1), brain injuries from blows to the head (2), and malnutrition from forced starvation. Very little is known about the longer-term health status of re-settled refugees. The most relevant data in this regard are from Wong et al.’s 2003–2005 random sample of Cambodians in California (3) who reported exceedingly poor health when compared to both the general population and to an Asian comparison group. Similarly, Koch-Weser et al (4) reported rates of fair or poor health in Cambodians living in Boston that were much higher (44%) than the national average of adults living in metropolitan areas (15%). The poor health of these communities was not accounted for by demographic factors such as age and socio-economic status.

Trauma exposure is one putative contributor to disease in these communities. A handful of studies suggest a positive association between trauma exposure and poor health in new refugees and asylum seekers (1,5,6). Trauma exposure and mass violence have also been linked to long-term, chronic health problems (7,8,9).

The psychopathology associated with mass violence has also been associated with health outcomes that are distal to the trauma including tinnitus in Cambodian refugees (10) and type 2 diabetes in asylum seekers in the Netherlands (11). In one of very few prospective studies, Mollica et al (12) found that 3-year risk of mortality among Bosnian refugees was three times higher among those with depression at baseline than those without depression. These data are consistent with a larger body of literature in non-refugee samples documenting that psychopathology, including post-traumatic stress disorder (PTSD), increases risk for subsequent chronic medical problems such cardiovascular diseases (13),

diabetes (14), and chronic pain (15). Although more than 2 decades have passed since resettlement, Southeast Asians in the US continue to have high rates of PTSD. In one of the largest random samples of Cambodians living in the US, Marshall et al. (16) found rates of PTSD exceeding 60%.

The medical and mental health problems in these long-settled refugee communities are compounded by a lack of access to linguistic and culturally appropriate services. Barriers to care include cost, transportation, and knowledge (17). Language is also a common barrier, with lower English language proficiency related to worse health (18). In a study by the California Endowment, fewer than 10% of the Vietnamese and Cambodians surveyed used trained interpreters (19).

Taken together, the literature suggests poor long-term health outcomes for these communities. However, studies are hampered by a lack of data regarding specific health conditions, and by typically small clinical samples that may be biased due to recruitment from psychiatry clinics. Furthermore, most studies have investigated trauma history vis-a-vis health status or access to care, but not their interrelationships. The purpose of this study was to examine associations among PTSD symptoms, health status, and healthcare access in Southeast Asian refugees in Connecticut.

Methods

Participants

The protocol for this study was approved by the Institutional Review Board of the Connecticut Children's Medical Center. Since it was desired that survey results should be generalizable within Connecticut, a sampling strategy was developed to yield a probability sample from each participating group (Cambodian, Vietnamese). The sampling frame was derived from all publicly listed telephone numbers with surnames known or thought to be Khmer or Vietnamese. An Internet web page, www.whitepages.com, was used to generate a list of all published numbers with each surname. These lists were compared to 2000 census data to estimate the proportion of the population in each group captured. From these lists, 190 individual telephone listings were selected at random, using a random number generator, for both of the groups. Given a proposed rate of screening failure of 30% and a refusal rate of 25%, 190 listings were estimated to yield a study sample of 100 which was calculated to yield adequate statistical power.

Persons residing in the household identified by telephone listing were eligible for interview if they were born in Cambodia or Vietnam and were at least 35 years of age. The age cut-off was chosen to exclude persons who were not at least 5 years of age in 1975. One respondent per listing was selected for interview by choosing the eligible person whose birth date was closest to the interview day.

Data Collection

Interviewers telephoned selected listings to screen for eligible participants and obtain an appointment for interview. Following verbal consent, the survey was administered through

face-to-face interviews during home visits conducted in Khmer or Vietnamese, as appropriate. All surveys were anonymous; no personal identifiers were recorded.

Measures

A structured questionnaire was developed that, whenever possible, relied on instruments and questions taken from either large national surveys or surveys validated among Cambodian and Vietnamese groups.

Trauma symptoms—The post-traumatic stress symptom subscale of the Harvard Trauma Questionnaire (HTQ; 20) assesses 16 of the 17 diagnostic criteria for PTSD (21) which measures symptoms of re-experiencing traumatic events, avoidance of stimuli associated with the trauma, numbing of general responsiveness and increased arousal. Physiological reactivity to events that symbolize or resemble the traumatic event, a symptom of arousal, is omitted because of the need for physiological measurements. Respondents are asked to what extent they had been disturbed by each symptom during the past week on a scale from 1 to 4. Symptom scores for the HTQ are expressed as arithmetic means of these item-specific scores. Indochinese versions of the HTQ have been validated against clinical diagnoses in a sample of Indochinese refugee patients in a psychiatry clinic in the United States (22), and in community samples (23), with well established psychometric properties.

Disease outcomes—Self-report questions regarding the presence of specific physician diagnosed health conditions were adapted as written from the Health Interview Survey (http://www.cdc.gov/nchs/nhis.htm). Conditions that were assessed included diabetes, hypertension, heart disease, and chronic pain; for example, “Have you ever been told by a doctor or other health professional that you had hypertension, also called high blood pressure?” Response options were “No” (0), “Yes” (1), “don’t know” (3), and refused (4). Items scored 1 indicated presence of the condition. Items were translated into Khmer and Vietnamese with back translation and external review.

Appraisal of general health—Individuals reported on their overall health by responding to the single item: “In general, would you say your health is…” with the following responses: Excellent (4), Very good (3), Good (2), Fair (1), or Poor (0).

Health care access and occurrence—We assessed multiple aspects of health care access. The first variable assessed the degree of understanding between individuals and their doctors; this variable is the mean of two items: “Do you worry that your doctor does not understand you?” and “Do you worry that you do not understand your doctor?” Response options for both items were “No” (0), “Sometimes” (1), “Often” (2), and “Always” (3). The internal consistency of the composite was high (alpha = .98). A second variable assessed the level of cost of and access to healthcare. This variable was the mean of two items: “In the past year, how often did you delay going to see your health care provider because it cost too much?” and “In the past year, how often were you not able to get the medication your doctor ordered?” Response options for both items were “more than once” (2), “one time” (1), and “did not delay getting healthcare because it cost too much” (0). The two items were highly correlated (r = .85); the internal consistency of the 2-item scale was high (alpha = .91). A

single item (“When you go to see your doctor, do you need an interpreter?”) assessed the need for an interpreter for one’s doctor (response options: no [0], yes [1]). It should be noted that this variable was only moderately correlated with the understanding variables, thus was examined separately. Finally, time since last healthcare visit was assessed with a single item (“when was the last time you saw a doctor or nurse?”); responses options were “In the past 6 months” (1), “6 months to 1 year” (2), “more than 1 year” (3), and “more than 5 years” (4).

Analysis

Given the nested data structure (individuals nested within families), and the possibility of non-independence of errors, we used hierarchical generalized linear modeling procedures (24). For binary outcomes (e.g., absence or presence of a disease) we specified Bernoulli sampling models with a logit link (i.e., multilevel logistic regression); for count outcomes (e.g., the number of diseases reported), we specified Poisson sampling models with a log link.

Results

A sample of 261 (47% Cambodians, 53% Vietnamese) was recruited. After deletion for missing data, we retained 229 individuals (49% Cambodians, 51% Vietnamese) nested within 88 families. The final sample was approximately evenly split by gender (54% female) and had a mean age of 52.3 (SD = 11.7; range 33.6 – 87.7).

The descriptive statistics for the study variables are shown in Tables 1 and 2. Hypertension was the most often reported illness and heart disease was the least often reported. This pattern mirrors that of national self-report data of the nearest available year from the Behavioral Risk Factor Surveillance System (BRFSS). The absolute rates in our sample were slightly higher than the unadjusted BRFSS rates (hypertension 31% vs 25%; diabetes 13% vs 8%; heart disease 7% vs 4%, respectively). Older individuals were more likely to report diabetes and hypertension and poorer appraisals of general health. Vietnamese, compared to Cambodians, reported greater lack of physician understanding and need for an interpreter, and less recent visits to the doctor. Vietnamese were also more likely to report hypertension, heart disease and chronic pain. Lack of physician understanding, greater cost and access problems and needing an interpreter were associated with poorer appraisals of general health. Finally, higher trauma symptom scores were associated with being older and having more cost and access problems.

We estimated multilevel linear and non-linear models to examine the unique effects of trauma on both the disease outcomes and the health care variables. Before estimating the models, both the trauma symptom score and the quantitative dependent variables were converted into z-scores, so coefficients for trauma symptom from the linear models can be interpreted as standardized coefficients.

Table 3 shows the results from models predicting the disease outcomes and the general health appraisal from trauma symptom, controlling for the health care variables, age, sex and country. We also created a count of the four disease outcomes, given that individuals could have more than one. Logistic models were used for the separate disease outcomes, a Poisson

regression was used for the count outcome, and a linear model was used for general health appraisals. As shown, individuals who reported greater trauma symptoms were more likely to report heart disease and hypertension (marginal significance) and lower levels of subjective health. For every one standard deviation increase in trauma symptoms, the odds of reporting heart disease increased by a factor of 1.82 and the odds of reporting hypertension increased by a factor 1.41. We estimated a supplemental model using a combined heart disease and hypertension outcome (34% of the subjects reported at least one or both diseases). Results from this model were similar to the models examining each separately, with trauma symptoms a significant predictor (b = .48, SE = .19, p = .026, Odds Ratio = 1.53).

Trauma symptoms also significantly predicted the count of diseases. Exponentiation of the slope yields a value of 1.22, which is the rate of increase in the number of diseases reported for every one standard deviation increase in trauma symptoms.

Finally, table 4 shows the results of the models examining the unique effects of trauma symptoms on the health care variables controlling for age, sex and country. Linear models were used for all outcomes except for need for interpreter, which was a logistic model. As shown, greater trauma symptoms were associated with greater lack of understanding and cost and access problems and a need for an interpreter. For the need for interpreter model, exponentiation of the coefficient for trauma symptom yields an odds ratio; specifically, for every one standard deviation increase in trauma symptom, the odds of needing an interpreter increase by a factor of 1.71.

DISCUSSION

The main findings from this study are that among Southeast Asians living in Connecticut, severity of trauma symptoms is related to 1) self-reported health outcomes including higher prevalence of cardiovascular disease, and a greater total number of health conditions, 2) worse subjective health, and 3) greater barriers to healthcare including cost and access problems, lack of understanding, and a need for an interpreter. These associations held even after controlling for important demographic factors that might better account for observed associations.

While high rates of PTSD (16) and poor health (3) have been documented in re-settled cohorts of Southeast Asian refugees, this is the first study to examine the association between trauma symptoms and poor health in a random sample. Data from clinical samples have documented that pre-migration trauma is linked to temporally distal poor health outcomes. Kinzie et al. (8) studied 459 Vietnamese, Cambodian, Somali, and Bosnian refugee psychiatric patients. They found that rates of hypertension and diabetes were higher in the high-trauma exposure group than in the low-trauma exposure group. Ta (7) evaluated 266 consecutive Southeast Asians, who had been patients of a psychiatric outpatient clinic since the 1980’s, for the presence of medical conditions. Fifty-five percent of the patients had one or more medical conditions, and the sequelae of war-related trauma were prominent. We did not find a relationship between trauma and diabetes or chronic pain. This may be due

to a smaller sample size than in studies with positive findings (11), or our measure of trauma symptoms rather than overt PTSD diagnosis per se.

Although not investigated in this study, there are behaviorally and biologically plausible mechanisms that might explain the link between trauma and disease. Those persons with greater trauma symptoms may be more likely to engage in health risk behaviors such as smoking, and less likely to engage in health promoting behaviors such as exercise (25). Alternatively, the physiological arousal observed in PTSD may alter neurochemicals in the brain that are related to cardiovascular functioning, metabolism, and other key physiological processes (26). Both behavioral and biological pathways may be involved, with the relative contribution of each differing for each individual. Genetic vulnerability to both psychopathology and the processes involved in the onset or progression of a given disease may also play a role (27).

While behaviorally and biologically plausible mechanisms can be hypothesized, it should be noted that victims of torture and organized violence may present with many non-specific health complaints that are a mix of physical and psychological contributors (28, 29). Mood can color self-report of health, such that at equivalent rates of disease, those patients with greater trauma symptoms may simply perceive more personal health problems. Patients with PTSD symptoms may also somaticize their psychological symptoms, giving physical expression to their emotional distress. For example, symptoms like tinnitus, headache, and dizziness, which can result from anxiety and panic, may be misattributed to medical conditions. Culturally based health beliefs may influence patients to consider common, nonpathological physical complaints, such as neck soreness, as indicating high blood pressure. Patients with low literacy may confuse medical terminology. Finally, while we asked participants about ‘physician diagnosed’ diseases, we cannot rule out the possibility of white coat hypertension.

Notwithstanding these concerns, data suggest that high rates of stroke, diabetes, and cardiovascular disease in these communities are real, that they are not just an artifact of patient misinterpretation of symptoms, patient confusion, or white coat hypertension. For example, Grigg-Saito et al. (30) report a disproportional risk for *mortality* from heart disease, stroke and diabetes in Cambodians living in Massachusetts relative to the general state population. Data from California (31), and our own data (32), also show high rates of these disorders.

Yet, physician diagnosed *hypertension* rates are actually not that much higher among Cambodians when broken down by age. Taken together, these patterns raise the concern that healthcare providers may attribute elevated blood pressure readings in patients from this community to anxiety and white coat hypertension, rather than to hypertension per se. We encourage healthcare providers to be attuned to trauma history during the medical evaluation (33), but, consistent with best practices (34), to first rule out organic bases of the chief complaint.

This study also complements data regarding limited access to healthcare among refugee populations. Despite the fact that only 10% of the study group reported not having insurance

of any type, approximately 30% indicated that they have delayed seeking medical attention or purchasing medication in the past year due to cost. Consistent with past studies, (4), this suggests that this population is not being sufficiently covered by insurance, experiences high co-pays (the amount paid out-of-pocket by the patient), or lacks knowledge about use of available coverage. Putative links between higher trauma and greater cost and access barriers include fewer financial resources at the time of immigration, higher rates of disability and low rates of employment, as well as social isolation and fewer informal financial resources.

Cost and access were not the only barriers to care. Participants endorsed additional barriers that emerged in the presence of a healthcare provider. Sixty-four percent indicated the need for a translator when visiting the doctor, and 95% of sample participants stated that it worries about the degree of understanding between the doctor and patient. Those respondents with higher trauma symptoms experienced more cost and access barriers, perceived poorer understanding with their healthcare provider, and were more likely to desire an interpreter. Thus, the patients who may be in the greatest need of healthcare services – those with the greatest trauma symptoms – are the patients experiencing the greatest challenge in receiving services. Recommendations have been made by the federal government to reduce the disease burden for these populations at the national, state, and local levels, but uptake of recommendations is suboptimal (28).

Limitations

To our knowledge, this is the first study of a random sample of Southeast Asians linking trauma symptoms, health outcomes, and healthcare access. Yet, limitations should be noted. Most importantly, health outcomes were per self-report, and general health was assessed with a single item, as opposed to a multi-item scale (e.g., 35). Hinton (36) discusses several complex ways that physical sensations linked to trauma and panic can influence perceptions of overall health. Future studies should investigate objective indicators of health status in addition to self-reported general health.

This study employed a cross-sectional design, such that the temporal unfolding of trauma, trauma symptoms, and health indicators cannot be established. Another underlying variable could account for observed associations, yet the most plausible demographics were controlled.

Since Khmer and Vietnamese surnames were used to elicit study participants, there might be some relevant segments of the Southeast Asian migration stream to Connecticut from Cambodia and Vietnam that were excluded from the survey, and some Southeast Asian homes may not have phones, or may rely on cell phones rather than land lines. The presence of respected and well-known interviewers in the participants' homes might have influenced the reporting of some health and trauma exposure because of confidentiality and stigma concerns. These limitations are generally outweighed by the study's strengths including investigation of physical as well as psychological wellbeing, assessment of healthcare access, a non-clinical sample, and hierarchical modeling to control for nesting within families.

Conclusion

Although the majority of Southeast Asian immigrants came to the United States as refugees approximately 20–30 years ago, there continues to be high levels of persistent trauma symptoms among this population which are associated with increased risk for disease and decreased access to healthcare services. Clinicians are encouraged to use best practices for assessment and care of these populations.

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Table 1

Descriptive statistics

	Cambodian M(SD) or %	Vietnamese M(SD) or %	Entire Sample M(SD) or %
Sex (% female)	63%	45%	54%
Age	51.3 (11.7)	53.3 (11.7)	52.3 (11.7)
Lack of understanding [a]	2.5 (.8)	2.9 (.7)	2.7 (.8)
Cost & Access problems [b]	1.6 (.9)	1.6 (.8)	1.6 (.8)
Recency of visits [c]	1.7 (1.0)	2.0 (.90)	1.8 (1.0)
Need interpreter (% yes)	70%	83%	76%
Diabetes (% yes)	15%	11%	13%
Hypertension (% yes)	23%	40%	31%
Heart disease (% yes)	3%	11%	7%
Chronic pain (% yes)	4%	12%	8%
HTQ symptom subscale [d]	2.2 (.6)	1.6 (.5)	1.9 (.7)
General health [e]	.9 (.9)	.9 (.8)	.9 (.9)

Note.

[a] mean of 2 questions, response options “No” (0), “Sometimes” (1), “Often” (2), and “Always” (3);

[b] mean of 2 questions, response options “did not delay getting healthcare because it cost too much” (0), “one time” (1), “more than once” (2);

[c] (1), “6 months to 1 year” (2), “more than 1 year” (3), and “more than 5 years” (4).

[d] Harvard Trauma Questionnaire;

[e] Poor (0), Fair (1), Good (2), Very good (3), Excellent (4).

Table 2

Correlations

			Correlations											
	M	**SD**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
1 Sex	.541	-												
2 Cambodian	.507	-	.179											
3 Age	52.304	11.707	.040	−.084										
4 Lack of understanding	2.705	.809	.152	−.247	.300									
5 Cost & Access problems	1.624	.824	.059	.001	.007	.073								
6 Need interpreter[a]	.764	-	.088	−.157	.240	.441	.072							
7 Recency of visits	1.843	.970	−.068	−.142	−.048	.114	.184	.080						
8 Diabetes[a]	.127	-	.008	.061	.251	.001	−.018	−.005	−.128					
9 Hypertension[a]	.314	-	.038	−.178	.414	.119	.063	.110	−.152	.251				
10 Heart disease[a]	.070	-	.046	−.141	.101	.089	.031	.031	−.026	.102	.146			
11 Chronic pain[a]	.079	-	.008	−.134	−.011	.066	−.015	.124	−.020	−.111	−.093	.111		
12 Trauma score	1.906	.663	.188	.485	.163	.053	.216	.080	.013	.121	.096	.057	−.061	
13 General health	.900	.863	−.104	−.019	−.412	−.225	−.143	−.329	.072	−.235	−.266	−.090	−.081	−.395

Note. Sex: 0 = male, 1 = female; Cambodian: 0 = Vietnamese, 1 = Cambodian;

[a]Binary variable coded 0 = no, 1 = yes; mean values represent proportions.

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Table 3

Multilevel regression results predicting disease outcomes and health appraisal

	Diabetes[a]		Hypertension[a]		Heart Disease[a]		Chronic Pain[a]		Count of Diseases[b]		Health Appraisal	
Predictors	**b**	**p**	**b**	**p**	**b**	**p**	**b**	**p**	**b**	**p**	**b**	**p**
Cambodian	0.471	.321	−1.058	.019	−1.842	.008	−1.000	.178	−0.502	.013	0.132	.357
Age	0.070	<.001	0.081	<.001	0.018	.409	−0.014	.491	0.036	<.001	−0.020	<.001
Sex	−0.216	.558	0.132	.729	0.415	.458	0.098	.823	0.052	.762	−0.003	.976
Need interpreter	−0.204	.714	−0.057	.893	−0.439	.529	1.587	.156	0.024	.905	−0.363	.003
Lack of understanding	−0.200	.379	−0.038	.864	0.224	.469	0.096	.703	0.015	.884	−0.041	.558
Cost& Access	0.005	.986	0.170	.367	0.036	.900	−0.055	.866	0.068	.477	−0.032	.575
Recency of visits	−0.412	.094	−0.550	.007	−0.209	.424	−0.143	.499	−0.287	.001	0.095	.081
Trauma	0.193	.354	0.342	.082	0.597	.023	0.055	.862	0.196	.035	−0.312	<.001

Note. Cambodian: 0 = Vietnamese, 1 = Cambodian; Sex: 0 = male, 1 = female; Degrees of freedom for all tests 220;

[a] *b* values represent the change in the predicted logit for a unit change in the predictor.

[b] *b* values represent the change in the log of the expected count for a unit change in the predictor.

Table 4

Multilevel regression results predicting health care variables

	Lack of Understanding		Cost & access problems		Recency of visits		Need interpreter[a]	
Predictors	**b**	**p**	**b**	**p**	**B**	**p**	**b**	**p**
Cambodian	−0.727	<.001	−0.346	.080	−0.449	.005	−1.662	.002
Age	0.022	.002	−0.004	.462	−0.007	.228	0.053	.003
Sex	0.333	.001	0.056	.574	−0.115	.384	0.538	.097
Trauma	0.190	.016	0.274	.004	0.136	.103	0.535	.023

Note. Cambodian: 0 = Vietnamese, 1 = Cambodian; Sex: 0 = male, 1 = female; Degrees of freedom for all tests 224;

[a]b values represent the change in the predicted logit for a unit change in the predictor.