PSYCHIATRIC AND SOMATIC SYMPTOMS OF TORTURED REFUGEES AND ASYLEES RESIDING IN PORTLAND, OREGON

By

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CERTIFICATE OF APPROVAL

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LIST OF ABBREVIATIONS

DM……..Diabetes

IPP……..Intercultural Psychiatric Program

MDD…….Major Depressive Disorder

NCTTP…….National Consortium of Torture Treatment Programs

OHSU……..Oregon Health & Science University

ORR…….Office of Refugee Resettlement

PTSD……Post Traumatic Stress Disorder

SoT…….Survivors of Torture

TTCO……Torture Treatment Center of Oregon

US…….United States

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CHAPTER 1 - INTRODUCTION

In 2014, there were 59.5 million forcibly displaced people worldwide. Of those, 19.5 million were refugees and 1.7 million were asylum applicants. Since the 1980s, research on the mental health of refugee and asylee populations has revealed wide variability in the prevalence of post-traumatic stress disorder (PTSD) and major depressive disorder (MDD). Prevalence estimates of PTSD, in particular, in conflict zones has ranged from 0% in Iran to 99% in Sierra Leone and from 3% to 86% for MDD, respectively.(1) This retrospective chart review focuses on a subset of the refugee and asylee population: torture survivors. It has been estimated that up to 70% of refugees treated in Western settings have been tortured, and that refugees resettled in Western countries are about ten times more likely to have PTSD than an age-matched general population.(2,3) In a meta-analysis by Steel et al., torture was found to be the most important risk factor associated with subsequent diagnosis of PTSD.(1) While many studies have looked at the general effects of trauma on psychiatric and somatic symptoms, torture is a substantial problem among refugees and asylees increasing the risk of “severe physical, psychological, social and welfare problems for survivors”.(4) Furthermore, there are limited studies available from which to understand the associations between torture and somatic and psychiatric illness in the same population.

In a recent analysis of refugee and asylees treated in the United States (US) per the National Consortium of Torture Treatment Centers (NCTTP), 69% of

9,025 refugee and asylee patients were diagnosed with PTSD. Additionally, 52.4% of patients were diagnosed with MDD, and 35% were diagnosed with comorbid PTSD and MDD. Notably, psychosis was not analyzed in this population, as “just a few individuals report(ed) psychotic symptoms”.(5) Thus, further review of psychosis is important to better understand the mental health of populations of refugees and asylees living in the US.

In regard to chronic somatic illnesses, such as hypertension and diabetes, a 2008 study of 459 refugees from Bosnia, Cambodia, Somalia, and Vietnam by Kinzie et al. found that the prevalence of hypertension was 42% and of diabetes was 15.5%, with higher rates in high-trauma compared to low-trauma groups.(6) These rates are much higher than the US national average of 31% for hypertension and 8% for diabetes.(7,8) Few studies have looked at the prevalence of chronic pain as a chronic somatic diagnosis in these patients, yet chronic pain is potentially elevated in these populations in addition to hypertension and diabetes.

The goal of this retrospective chart review is to examine the association between exposure to torture and the diagnoses of psychiatric illness (including MDD, PTSD, and psychosis) and of somatic illness (hypertension, diabetes, and chronic pain) in refugee and asylee populations residing in Portland, Oregon. We have also considered the effect of several demographic variables on these associations. We hope this study will help to increase access to care by

improving screening processes and thus improve health outcomes in refugee and asylee populations.

CHAPTER 2 - METHODS

This retrospective chart review took place through the Torture Treatment Center of Oregon (TTCO), which is part of the Oregon Health & Science University (OHSU) Intercultural Psychiatric Program (IPP) in Portland, Oregon. The OHSU IPP has been providing mental health services to refugees, asylees, and immigrants since 1977. In 2015, there were 1,300 patients being actively treated at the OHSU IPP. The IPP clinic is actively collecting data regarding torture victims for a national database through the NCTTP and for funding specifically designated for Survivors of Torture (SoT) through the Office of Refugee Resettlement (ORR) under a federal agency in the US Department of Health and Human Services. The IPP uses the US legal definition of torture: “Torture means an act committed by a person acting under the color of law specifically intended to inflict severe physical or mental pain or suffering (other than pain or suffering incidental to lawful sanctions) upon another person within his custody or lawful control.”(9)

250 patients from the total 1,300 patients treated at the OHSU IPP were known to have met the US definition of torture and received care at least once at the IPP during the reporting period from April 1st to September 29th, 2015. 85% of the 250 patients had received care at the IPP prior to this six-month period and were continuing care, while the remaining 15% were new intakes. Of the 250 patients meeting the US definition of torture, data on both somatic and psychiatric

diagnoses were available for 148 patients who had also completed the ORR data collection SoT survey in its entirety. Thus, our study focused on data collected from these 148 patients.

Data Collection and Analysis

The study was approved by the OHSU Institutional Review Board prior to data acquisition by the research team. In addition to reviewing chart records for psychiatric and somatic diagnoses, each patient completed an approved survey from the ORR Survivors of Torture (SoT) Program either on their own or with a trained case manager from their country of origin, who also worked to translate as needed (see Office of Refugee Resettlement Survivors of Torture screening survey in Appendix A).

The ORR SoT survey includes 17 questions. The data collected from this survey included: immigration status at intake, employment status at intake, housing status at intake, time between arrival in US and seeking mental health care, age at first torture, number of types of torture experienced, and survivor type (categorized as either primary survivor if the patient was tortured, secondary survivor if a family member was tortured, or both primary and secondary survivor). The variable "number of types of torture experienced" included 10 different types of torture, including beating, wounding[1], rape, witnessing torture, deprivation[2],

[1] Wounding is defined as attacks with sharp instruments, breaking bones, being thrown from heights, nail removal, amputation, or medical experimentation.
[2] Deprivation is defined as being deprived of food and/or water, sleep, or needed medical attention, forced feeding, immobilization, or being placed in isolation more than 72 hours.

sensory stress[3], threats, severe humiliation, kidnapping, and "other"[4]. ORR provided clear definitions for each of these named types of torture. Responses to all survey questions were categorized; for example, "age at first torture" and "age at intake" were originally categorized into seven categories. The ORR SoT Program staff determined all survey categories in 2010; the distribution of ages within each category seems to correspond with developmental stages.

Consideration of the variable "immigration status at intake" is important because refugees and asylees have very different journeys to the US and support upon arrival. Refugees considered for resettlement are interviewed in a neutral country. UN and US officials traditionally resettle approximately 0.04% of refugees.(10) Approval for resettlement occurs based on severity of trauma experienced and/or threat to the refugee's life if they returned home. Upon arrival, refugees are resettled through federal authorities and subsidiary organizations and provided with core services, including food, housing, medical, and employment services, for at least three months. Furthermore, when a refugee arrives to the US, they have a set legal status as a refugee and are on a path to legal permanent residency and citizenship if they desire. By contrast, asylum seekers flee to a host country and apply to go through a process to qualify for international protection. Even if as asylum seeker is offered asylum (and thus would be called an asylee), asylees are not guaranteed the same legal status

[3] Sensory stress is defined as exposure to extreme heat or cold, loud/disagreeable noises, powerful lights, being bound or tied up as a form of immobilization, or psychological torture.
[4] "Other" types of torture included: burning, asphyxiation, forced postures, pharmacological, dental, and electrical acts. These 6 types of torture were rarely reported and thus not looked at separately.

when they arrive or any core services from subsidiary organizations. (11)

Psychiatric diagnoses at the IPP were made by board certified psychiatrists using DSM V criteria and ICD-10 coding. Medical diagnoses were made by either direct laboratory or physical exam data (i.e. hemoglobin A1C to diagnose diabetes and blood pressure readings to diagnose hypertension) or by chart notes provided by the treating primary care provider.

All statistical analyses were performed using Stata 14.1 (copyright StataCorp LP), and an alpha of $p < .05$ was used as the cut-off for statistical significance, including for trend analyses. Descriptive statistical analyses revealed the distribution of all variables. Pearson's Chi Square tests were used to examine the association between exposure variables and both psychiatric and somatic diagnoses. Some outcome variables were looked at both separately and as a combined variable to allow for better comparison between studies. For example, the diagnoses of MDD and PTSD were combined, as these diagnoses are often comorbid.

Logistic regression models were fit for each diagnostic outcome. For categorical variables with more than two categories, a reference group was chosen according to norms in the data and per literature review to allow for accurate modeling. In Table 1 the reference group used for each is marked with an asterisk (*). Additionally, subgroup analyses were performed by gender, country of origin, age at first torture experience, type of torture experienced, and total number of types of torture events experienced. Student t-tests were used to

compare outcomes for different subgroups. Spearman's correlation was used to estimate correlations between types of torture. Analyses were also performed to analyze trends between diagnostic outcome variables and the following exposure variables: age at first torture, age at intake, and number of torture events.

Countries Represented by Sample Population

Refugees resettled in Oregon were primarily from Cuba, Burma, Bhutan, Iran, Iraq, and Somalia as of 2015.(12) Since 2001, between 800 and 1,600 refugees have been resettled in Oregon each year.(12) The 148 patients in our sample come from 14 different countries, with 4 countries (Bosnia, Ethiopia, Iraq, and Somalia) each accounting for at least 20% of the total patients. The other 10 countries from which patients came from include: Bhutan, Burma, Cameroon, Democratic Republic of Congo, Eritrea, Ivory Coast, Kosovo, Senegal, Serbia, and Sudan. As more than 85% of the total patients are from Bosnia, Ethiopia, Iraq, and Somalia, the history of each conflict leading to the refugees and asylees fleeing to the US from these 4 countries is briefly described below.

Bosnia

2.6 million Bosnians became refugees or were internally displaced in the late 1990s after the Bosnian War and the breakup of Yugoslavia.(13) The Bosnian War was notable for the use of rape as a weapon of war as part of ethnic cleansing. This sexual violence was often carried out in concentration camps

and aimed at both genders. The US continued to receive some of the highest numbers of refugees from Bosnia and Herzegovina through 2005.(14,15)

Ethiopia

Since the mid-1970s, political turmoil, famine, and drought have caused about 1.25 million Ethiopians to flee to neighboring countries, including a small portion immigrating to the US. The majority of Ethiopian refugees to the US arrived in the mid-1990s after the Eritrean-Ethiopian War.

Iraq

Since the Iran-Iraq War in 1980, there has been consistent instability in Iraq, including the Gulf and Iraq Wars. As of 2007, there were approximately 4 million displaced Iraqis around the world. There have been approximately 85,000 Iraqi refugees officially resettled in the United States since 2007.(16)

Somalia

Since the overthrow of the Somali government in 1991, Somalia has been in the hands of various warlords and the country has failed multiple attempts to reinstate a government. Refugees and asylum seekers have experienced a range of trauma, starvation, and torture related to violence from warlords and disorder. As of 2012, there are about 980,000 Somalis displaced outside of Somalia. Somali men reported significantly increased rate of torture compared to Somali women in a study of trauma in Somali refugees; however, women reported sexual violence significantly more often than men. (17)

CHAPTER 3 - RESULTS

Characteristics of the IPP Patient Sample

Characteristics of all 148 patients are presented in Table 1. As all survey responses were categorized, we cannot provide accurate estimates of a true median or mode, and thus will utilize the provided categories to describe the study patients. 53.4% of patients were male and 46.6% were female with an average age at the time of intake between 25 and 64 years. The average age at first torture experience was between the ages of 14 and 24 years, and the majority of patients reported age of first torture experience occurred after age 24 years. In regard to immigration status at intake, 16.2% were either asylum seekers or asylees, 67.6% were refugees, and 12.6% were permanent residents or US citizens.

Table 1. Characteristics of 148 primary and secondary torture patients receiving care at the Intercultural Psychiatric Program in Portland, Oregon during 2015

Variables	Mean / n (%)
Number of Types of Torture	3.29 (range 1-10)
Gender	
Male	79 (53.4%)
Female	69 (46.6%)
Country of Origin	
Bosnia	35 (23.7%)
Ethiopia	31 (21.0%)
Iraq	27 (18.2%)
Somalia	33 (22.3%)
Immigration Status at Intake	
Asylum Seeker/Asylee	24 (16.2%)
Refugee	100 (67.6%)
Perm. Res./US Citizen*	18 (12.6%)
Employment Status at Intake	
No work authorization	9 (6.72%)
Unemployed & not seeking work	42 (31.3%)
Unemployed & seeking work	17 (12.7%)
Employed	18 (13.4%)
Unable to work	41 (30.6%)
Student	4 (3.0%)
Primary caregiver	0 (0.0%)
Other	3 (2.2%)
Housing at Intake	
Stable housing *	125 (84.5%)
Unstable/homeless	18 (12.2%)
Other	5 (3.4%)
Age at Intake (years)	
18-24	11 (7.4%)
25-44	64 (43.2%)
45-64	63 (42.6%)
65+ *	10 (6.8%)
Age at first Torture Experience	
Under 14 years old	6 (4.1%)
Between 14 and 24 years old	40 (27.0%)
Greater than 24 years old *	102 (68.9%)

Time Between Arrival in US and Intake (months)	24 (17.3%)
0-6 *	22 (15.8%)
7-12	13 (9.4%)
13-24	13 (9.4%)
25-36	8 (5.8%)
37-48	10 (7.2%)
49-60	49 (35.3%)
61+	
Time Between Age at first Torture and Intake (years)	
< 5*	1 (0.7%)
5-10	9 (6.34%)
10-20	58 (40.9%)
20-30	58 (40.9%)
30-40	4 (2.8%)
40+	12 (8.5%)
Survivor Type	
Primary *	115 (77.7%)
Secondary	7 (4.7%)
Both	26 (17.6%)

Psychiatric and somatic outcomes of the 4 countries primarily represented by these data are shown in Table 2 as well as the column ”other” representing the 10 other countries in this our study population. Across all countries, the average number of torture events per person had a narrow range of 2.9 to 3.7 with similar medians and interquartile ranges. The most common types of torture reported across the 4 countries were: threats (73.0%), witnessing of torture (52.7%), beating (49.3%), and deprivation (31.8%). Somalia differed in that rape was the second most common type of torture experienced at 48.5%. The highest prevalence of both PTSD and/or psychosis was in patients from Somalia; 96.97% of patients from Somalia were diagnosed with PTSD and 27.3% with psychosis. This cannot be explained by age of first torture or age of intake, as the mean falls

within the same categories across all countries. MDD was most common in patients from Iraq (96.3%), while prevalence of psychosis was lowest in patients from Iraq (3.70%).

Table 2. Number of Torture Events and Diagnoses by Country of Origin for 148 torture patients receiving care at the Intercultural Psychiatric Program in Portland, Oregon during 2015.[a]

	Bosnia	Ethiopia	Iraq	Somalia	Other
Total patients	35	31	27	33	22
Mean number of torture events	3.4	3.2	2.9	3.5	3.7
Psychiatric Diagnosis n (%)					
MDD	26 (74.3)	26 (83.9)	26 (96.3)	30 (90.9)	18 (81.8)
PTSD	32 (91.4)	23 (74.2)	24 (88.9)	32 (97.0)	16 (72.7)
Psychosis	8 (22.9)	6 (19.4)	1 (3.7)	9 (27.3)	7 (31.82)
MDD + PTSD	26 (74.3)	21 (67.7)	24 (88.9)	30 (90.9)	13 (59.1)
MDD + Psychosis	4 (11.4)	4 (12.9)	0 (0.0)	8 (24.2)	4 (18.2)
Somatic Diagnosis					
HTN	20 (57.1)	15 (48.4)	8 (29.6)	14 (42.4)	3 (13.6)
DM	7 (20.0)	9 (29.0)	3 (11.1)	6 (18.2)	5 (22.7)
Pain	22 (62.9)	9 (29.0)	15 (55.6)	23 (69.7)	11 (50.0)
All Somatic Diagnoses	30 (85.7)	22 (71.0)	18 (66.7)	27 (81.8)	13 (59.1)

[a] Conditions are not mutually exclusive and therefore percentages will not sum to 100%.

In regard to somatic diagnoses, hypertension was the most common diagnosis for both Bosnian and Ethiopian patients. The prevalence of both hypertension (29.63%) and diabetes (11.11%) was lowest in patients from Iraq. This low prevalence of hypertension and diabetes cannot be explained by age at the time of intake, as the average age at intake fell into the same survey category of “25 to 44 years” for all four countries. The rate of chronic pain in Ethiopian

patients was much lower than in other countries at 29.03%, compared to an average of 62.71% in Bosnian, Iraqi, and Somali patients.

Associations Between Types of Torture and Psychiatric and Somatic Diagnoses

Of the 10 types of torture reviewed, we only observed higher odds of psychiatric diagnoses when looking at each type of torture individually. The odds ratio of MDD associated with severe humiliation was 7.45 compared to those who did not report experiencing severe humiliation (p=0.03). The odds of PTSD were significantly higher in those who experienced rape (OR: 11.23, p=0.02) or beating (OR: 2.79, p=0.04). Lastly, the odds of having comorbid MDD and psychosis was 3.10 times higher in those patients who witnessed a torture event (p=0.03). See Table 3 for all associations between types of torture and both psychiatric and somatic diagnoses.

Table 3. Relationships per chi-square odds ratios between torture type and either psychiatric or somatic diagnoses for 148 torture patients receiving care at the Intercultural Psychiatric Program in Portland, Oregon during 2015[b]

	MDD	PTSD	Psychosis	MDD & PTSD	MDD & Psychosis	Hyper-tension	Diabetes	Chronic Pain	Any Somatic diagnosis
Type of torture	**Chi-square test odds ratio (p-value)**					**Chi-square test odds ratio (p-value)**			
Beating	0.97 (0.94)	**2.79 (0.04)**	0.81 (0.60)	1.31 (0.49)	1.65 (0.30)	1.31 (0.42)	1.03 (0.93)	0.76 (0.42)	0.96 (0.92)
Wounding	1.34 (0.66)	2.10 (0.33)	1.23 (0.68)	1.69 (0.36)	2.46 (0.09)	0.40 (0.07)	0.71 (0.56)	1.45 (0.27)	1.47 (0.48)
Rape	5.20 (0.08)	**11.23 (0.02)**	0.44 (0.19)	**9.27 (0.01)**	0.81 (0.75)	0.74 (0.50)	0.67 (0.49	0.95 (0.40)	1.19 (0.74)
Deprivation	0.50 (0.13)	1.19 (0.74)	1.23 (0.62)	0.69 (0.36)	1.18 (0.74)	0.76 (0.46)	0.59 (0.57)	0.69 (0.89)	1.01 (0.98)
Sensory Stress	0.65 (0.49)	1.57 (0.56)	1.31 (0.63	1.22 (0.73)	0.68 (0.62)	0.97 (0.96)	1.37 (0.61)	0.83 (0.70)	1.04 (0.94)
Threats	1.32 (0.58)	0.82 (0.72)	0.72 (0.46)	0.64 (0.34)	1.13 (0.83)	1.38 (0.40)	1.28 (0.37)	0.54 (0.10)	0.79 (0.59)
Witnessing Torture	0.74 (0.52)	2.00 (0.15)	2.21 (0.06)	0.99 (0.97)	**3.10 (0.03)**	1.64 (0.14)	1.45 (0.13)	0.88 (0.70)	1.15 (0.70)
Severe Humiliation	**7.45 (0.03)**	0.95 (0.92)	0.43 (0.13)	1.52 (0.40)	0.82 (0.73)	1.03 (0.93)	1.96 (0.80)	0.81 (0.59)	1.16 (0.74)
Kidnapping	0.69 (0.49)	1.78 (0.38)	1.67 (0.26)	0.87 (0.76)	1.68 (0.33)	0.85 (0.69)	1.13 (0.66)	1.32 (0.50)	0.70 (0.41)
Other	1.41 (0.56)	0.95 (0.92)	0.76 (0.59)	1.20 (0.71)	0.82 (0.73)	0.88 (0.76)	0.80 (0.50)	0.69 (0.35)	0.65 (0.31)

[b] Bolded p-values are statistically significant at <.05.

Over 80% of patients experienced more than one type of torture. To help compare different types of torture, we collapsed the 10 torture types into two groups: passive experience (defined as a non-physical torture experience, e.g. witnessing torture and severe humiliation) and active experience (defined as a physical torture experience, e.g. beating and rape). We found that patients with PTSD or psychosis were more likely to have experienced either active events or a combination of both passive and active events (PTSD: 79.41% for passive compared to 86.67% for active, p=0.53; psychosis: 17.65% for passive compared to 26.67% for active, p=0.51). In contrast, more patients diagnosed with MDD had experienced only passive torture events compared to active events (94.12% compared to 86.67%, p=0.46).

Results by Psychiatric Diagnosis

Table 4. Relationship per chi-square tests between psychiatric diagnoses and significant outcome variables for 148 torture patients receiving care at the Intercultural Psychiatric Program in Portland, Oregon during 2015[bc]

[b] Red outlined bar charts are statistically significant with p-values at <.05.
[c] Blue color denotes the percent of population diagnosed within each sub-category (column) for a particular outcome variable (row).

Major Depressive Disorder

85% of patients in our sample were diagnosed with MDD. As the age at first torture increased, the odds of MDD also increased per trend analysis (p=0.03). Age at first torture experience also made a significant impact on the odds of torture victims being diagnosed with MDD in the regression analysis, as did employment status at intake. In the regression model, the odds of having MDD for those who are unable to work are 7.19 times the odds of MDD for an unemployed person who is able to work (p=0.02) and 10.20 times the odds of MDD for those who are employed or a student (p=0.01). Compared to the odds ratio of MDD for those who experienced a torture event before age 14 years, the odds ratio of having MDD for those who first experienced a torture event between ages 14 and 24 years was 15.13 times higher (p=0.03) and the odds ratio of having MDD for those who first experienced a torture event after age 24 years was 14.46 times higher (p=0.02).

Additionally, subgroup analyses were used to compare passive and active torture experiences and MDD was found to be more common among those patients experiencing only passive torture (94.12%) compared to those who either had only active experiences (86.67%) or had both passive and active experiences (82.29%).

Post-traumatic Stress Disorder

86% of patients were diagnosed with PTSD and 77% were diagnosed with comorbid MDD and PTSD. Per trend analyses, odds of PTSD generally increased with number of types of torture events (p=0.05). Also, with collapsing the variable “number of types of torture events” into “three or fewer events” and “four or more events”, we found an almost 10% increase in diagnosis of PTSD for patients with four or more types of torture experiences compared to those with less than four types of experiences. Age at first torture experience was the only exposure variable that had a significant impact on odds of PTSD. The odds ratio of having PTSD for those who first experienced a torture event after age 24 years was 16.67 times higher than the odds ratio of PTSD for those who experienced a torture event before age 14 years (p=0.002).

The variable of age at first torture experience was also the only exposure variable that had a significant impact on odds of comorbid MDD and PTSD. The odds of having comorbid MDD and PTSD for those who first experienced a torture event after age 24 years were 7.71 times the odds of comorbid MDD and PTSD for those who experienced a torture event before age 14 years (p=0.023).

Psychosis

21% of patients were diagnosed with psychosis and 14% were diagnosed with comorbid MDD and psychosis. There was a significant increase in trend of odds of psychosis with younger age at first torture experience (p=0.004). In the

regression model, the odds of PTSD increased with younger age, being a primary torture survivor, and being deemed “able to work” even if the patient was currently unemployed. In particular, the odds ratio of having psychosis for those who first experienced a torture event before age 14 years was 16.91 times the odds ratio of psychosis for those who experienced a torture event after age 24 years (p=0.007). The odds ratio of psychosis in a primary survivor of torture was 7.81 times higher than the odds ratio in patients who were both a primary and a secondary torture survivor (p=0.057). And the odds ratio of having psychosis for those who are unemployed but able to work was 4.32 times the odds of psychosis for those who are unable to work (p=0.02).

For patients with comorbid MDD and psychosis, males were also found to be much more likely to have comorbid MDD and psychosis compared females (48.28% compared 8.70%).

Results by Somatic Diagnosis

Table 5. Relationship per chi-square tests between somatic diagnoses and outcome variables for 148 torture patients receiving care at the Intercultural Psychiatric Program in Portland, Oregon during 2015[bc]

[b] Red outlined bar charts are statistically significant with p-values at <.05.
[c] Blue color denotes the percent of population diagnosed within each sub-category (column) for a particular outcome variable (row).

Hypertension

40.5% of patients were diagnosed with hypertension. The odds of hypertension were higher with both increasing age at first torture experience ($p=0.01$) and increasing age at time of intake ($p<0.01$). Age at first torture experience and torture survivor type made a significant impact on the regression model. In particular, the odds ratio of having hypertension for those who first experienced a torture event after age 24 years was 6.25 times higher than the odds ratio of hypertension for those who experienced a torture event before age 14 years ($p=0.07$) and 3.00 times higher than the odds ratio of hypertension for those who experienced a torture event between ages 14 and 24 years ($p=0.01$). Also, for secondary torture survivors, the odds ratio of having hypertension was 20.98 compared to the odds of hypertension for those who are a primary torture survivor. ($p=0.03$)

Diabetes

20.3% of patients were diagnosed with diabetes (type I or type II). Diabetes diagnosis was not found to be significantly associated with any of the exposure variables considered in this study.

Chronic Pain

54.1% of patients were diagnosed with chronic pain. With increasing age at first torture experience the odds of having a diagnosis of chronic pain

significantly increased (p=0.02). The odds of chronic pain in the regression model were significantly impacted by immigration status at intake and gender. The odds ratio of having pain for those who were a refugee at the time of intake was 3.57 compared to the odds ratio of chronic pain in those who were a permanent resident at time of intake, controlling for gender (p=0.02). Table 5 demonstrates the stratification of psychiatric and somatic diagnoses by immigration status at intake; the difference in prevalence of chronic pain between refugees and asylees is the most significant.

In subgroup analysis, females were diagnosed with pain 20.91% more often than males (65.22% compared to 44.30%).

Table 6. Immigration Status at Intake and Both Psychiatric and Somatic Diagnoses for 148 torture patients receiving care at the Intercultural Psychiatric Program in Portland, Oregon during 2015[b]

	Asylee	Refugee	Difference	P-value
	n (%)	n (%)	%	T-test
Psychiatric Diagnosis				
MDD	21 (87.5)	84 (84.0)	3.5	0.26
PTSD	19 (79.2)	91 (91.0)	11.8	0.33
Psychosis	5 (20.8)	20 (20.0)	0.8	0.71
MDD + PTSD	18 (75.0)	80 (80.0)	5.0	0.92
MDD + Psychosis	4 (16.7)	13 (13.0)	3.7	0.46
Psychiatric Diagnosis				
HTN	7 (29.2)	42 (42.0)	12.8	0.14
DM	4 (16.7)	18 (18.0)	1.3	0.96
Pain	8 (33.3)	64 (64.0)	30.7	**0.02**
Somatic Diagnosis	16 (66.7)	78 (78.0)	11.3	0.25

[b] Bolded p-values are statistically significant at <.05.

Any Somatic Diagnosis

74.3% of patients were diagnosed with at least one of the three reviewed chronic somatic diagnoses (hypertension, diabetes, or chronic pain). Trend analysis demonstrated a significant increase in odds of diagnosis of a chronic somatic disease with increasing age at first torture event (p=0.02). In the regression model, the odds of having any somatic diagnosis was significantly impacted only by age at intake with an the odds of a somatic diagnosis 6.36 times higher for those between 45 and 64 years of age at intake compared to 18 and 24 years of age (p=0.01).

Associations Between Psychiatric and Somatic Diagnoses

While there were not significant relationships found between MDD or psychosis with any of the somatic outcomes (hypertension, diabetes, or chronic pain), the diagnosis of PTSD had significant associations with these outcomes. PTSD is associated with increased hypertension (p=0.008), chronic pain (p=0.011), and any somatic diagnosis (p=0.01). See Table 6 for all associations between psychiatric and somatic diagnoses.

Table 7. Relationship per chi-square tests between psychiatric diagnoses and somatic diagnoses for 148 torture patients receiving care at the Intercultural Psychiatric Program in Portland, Oregon during 2015[b]

Variables	Hypertension	Diabetes	Chronic Pain	Any Somatic diagnosis
	Chi-square test p-value			
MDD	0.67	0.38	0.68	0.85
PTSD	**0.01**	0.31	**0.01**	**0.01**
Psychosis	0.29	0.17	0.26	0.16
MDD & PTSD	0.06	0.31	0.19	0.14
MDD & Psychosis	0.59	0.57	0.93	0.15

[b] Bolded p-values are statistically significant at <.05.

CHAPTER 4 - DISCUSSION

Our study tested associations between history of torture experiences and both somatic and psychiatric diagnoses for 148 patients who came to Portland, Oregon as refugees or asylees and received care at the Intercultural Psychiatric Program (IPP). These patients have experienced a broad range of trauma either in their home country or on their journey to the US, and all reported primary and/or secondary torture experiences. As refugees typically receive more support than asylees in regard to both the journey to the US and services provided upon arrival, the level of economic and social support varied substantially in our study population, potentially modifying their physical health conditions and care needs.

To test this hypothesis, we used the variables of employment, immigration, and housing status as proxies for economic and social support. In regard to employment status, we found that the odds of having MDD or psychosis were significantly higher for those who are unable to work compared to those who are employed or are students (p=0.01). Likewise, we found refugee status, compared

to those who were US citizens at intake, to be associated with higher odds of chronic pain. In regard to housing status, we did not find significant associations between housing and either somatic or psychiatric diagnoses; however, 84.5% of the patients in our study labeled their housing status as “stable”. While this finding may be accurate, the way each patient defines “stable housing” may differ considerably making this a difficult variable to utilize in our study. In sum, patients who are employed or who are students have lower odds of psychiatric illness and patients who have become US citizens have lower odds of somatic illness.

A dose-response relationship between trauma exposure and psychological distress in refugees has been described with greater PTSD, anxiety, and MDD in patients with exposure to more trauma experiences.(1,18) In our study population, there was a significant trend between number of types of torture events and PTSD. In populations of tortured refugees and asylees, PTSD, in particular, should be considered as a diagnosis when a patient presents with many types of torture events. In our study, three different types of torture was the mean number of types of torture, so more than three types would be considered an elevated number of types of torture experienced.

A 2016 study demonstrated that the “recency of trauma (particularly postpuberty) predicted presence of a PTSD diagnosis.”(19) We found that having a first experience of torture after age 24 years was associated with odds of PTSD that were 16.67 times higher than in those patients who had a first experience of torture before age 14 years ($p=0.002$). The recency of trauma experience

predicting diagnosis also held true for MDD and hypertension in our population. The odds of MDD in the older than age 24 years group compared to the less than age 14 years group were 14.46 times higher in regard to age at first torture (p=0.02). And the odds of having hypertension for those who first experienced a torture event after age 24 years were 6.25 times the odds of hypertension for those who experienced a torture event before age 14 years (p=0.07). Therefore, our results are consistent with the hypothesis that more recent trauma predicts non-psychotic psychiatric disorders. And, this hypothesis may also hold true for somatic diagnoses, such as hypertension. As with all of our data, we do not have exact dates for “age at first torture” and “age of intake” (as the survey utilized categories for ages) and using exact dates would allow us to analyze trend more accurately. Also, while early childhood and puberty are known to be periods particularly sensitive to trauma due to increased neuroplasticity, the study population did not include enough patients with initial trauma before age 14 years to study potential associations between PTSD and torture at developmental stages.(20)

The odds of psychosis increased significantly with younger age at first torture experience (p=0.004) as opposed to the trends of both odds of MDD and PTSD increasing with older age at first torture experience. The odds of psychosis in those who experienced a torture event before age 14 years were 16.91 times the odds of psychosis in those who experienced a torture event after age 24 years (p=0.007). Population-based studies have found that childhood trauma is

consistently an independent risk factor for psychosis due to a number of potential psychiatric and biological mechanisms. In line with this finding about trauma generally, patients experiencing first torture events before age 14 years should be evaluated for psychosis.

Psychosis was much higher among Somali patients at 27.3% compared to an average prevalence of psychosis of 15.33% in patients from Bosnia, Ethiopia, and Iraq. Psychosis may be more common in Somalis because of the high rates of certain types of torture, such as rape (48.5% of patients reported) or witnessing of torture (66.7% reported), but the explanation may be more complicated than that. Studies of disparities in psychosis among racial and ethnic groups have shown that psychosis is higher among non-Hispanic blacks. This association remains statistically significant after adjustment for age, sex, maternal education, and physical health conditions.(21) Furthermore, African Americans and Blacks are diagnosed with a psychotic disorder at a rate of on average 3 to 4 times higher than Euro-Americans or Whites. Schwartz hypothesized that this difference could be due to misdiagnosis of immigrants related to misunderstanding or biases about symptoms, because overdiagnosis of psychosis is common in immigrants in both the US and other countries.(22) Increased risk of psychosis could also be related to the chewing of leaves from khat trees, which act as a mild stimulant and is a common practice in Somalia and other East African and Arab countries. A 2014 study found evidence for the high prevalence of comorbid psychiatric symptoms, particularly psychosis, and

khat use as self-medication among male Somali refugees.(23) In summary, while our study gives evidence that increased rates of psychosis in Somali refugees could be related to high rates of rape and witnessing of torture, the diagnosis of psychosis may be confounded by a number of different factors.

Looking at associations between psychiatric and somatic outcomes, PTSD was found to be significantly associated with both hypertension and chronic pain. Psychological trauma, specifically PTSD, has been shown in previous studies to be associated with cardiovascular disease, diabetes, and chronic pain (specifically arthritis).(24) In a study of patients with chronic war-related PTSD from Bosnia and Herzegovina, a significantly higher rate of metabolic syndrome (defined as having at least 3 of the following 5 risk factors: abdominal obesity, hypertension, elevated blood glucose, elevated serum triglycerides, and low high-density lipoproteins) was found; hyperglycemia and abdominal obesity were most prevalent of the 5 risk factors.(25) Our results are consistent with the increase of factors of metabolic syndrome, particularly hypertension, in PTSD.

Many recent studies have looked at the underlying pathophysiology of this relationship between PTSD and hypertension. Persistent hyperarousal symptoms in PTSD seem to be due to high sympathetic activity coupled with low parasympathetic control; thus, autonomic dysregulation in trauma patients may account for the relationship we identified between psychiatric and somatic illness in our population.(26) Also, enhanced inflammatory susceptibility leading to hypothalamic-pituitary-adrenal (HPA) axis dysfunction and hypercortisolism has

also been associated with both psychiatric illness, such as MDD and PTSD, as well as many chronic illnesses, including hypertension and chronic pain.(27,28)

Certain types of torture had significant associations with both psychiatric and somatic outcomes. The odds of MDD in patients reporting severe humiliation were 7.45 times higher compared to those patients who did not report experiencing severe humiliation. The odds of PTSD were significantly higher with both experience of rape (OR: 11.23, p=0.02) and beating (OR: 2.79, p=0.04). And the odds of having comorbid MDD and psychosis were 3.10 times higher in those patients who witnessed a torture event (p=0.03). When comparing passive and active forms of torture, we found that more patients diagnosed with MDD had experienced only passive torture events compared to active events. Both PTSD and psychosis patients were more likely to have experienced either active events or a combination of both active and passive events. Finding out whether a torture experience was passive or active is informative of risk. Therefore, care providers may not need to ask about the details of types of torture a patient experienced. This is helpful as getting a patient to disclose details about a torture experience typically requires time to build a trusting relationship, while asking about passive versus active events might be possible in a patient-clinician relationship that has yet to build up that level of trust. Consequently, more refugees are likely to access helpful valuable care and services if a provider can find out if a torture experience was passive or active in an initial encounter. The standardization of categorizing types of torture as passive or active would also allow for easier

comparison across clinics and research studies, as definitions of specific types of torture can differ.

The prevalence of somatic illnesses in our study population appears to be much higher than the general US population. The prevalence of hypertension in the study population of 40.5% and of diabetes at 20.3% are higher than the US national average of 31% and 8%, respectively.(7,8) And the prevalence of chronic pain of 54.1% (65.22% in females and 44.30% in males), is also higher than the estimated prevalence of chronic pain in the US of 30.7%.(29) The increased prevalence of all reviewed chronic somatic diagnoses is important to consider in this population of refugees and asylees, as screening, prevention, and treatment will all be necessary to improve care and health outcomes. Additionally, other factors of metabolic syndrome not reviewed in this study, as well as inflammatory bowel syndrome and other chronic gastrointestinal diseases, should be considered in future studies.

We can compare our findings to the 2015 review by the NCTTP of psychiatric outcomes in 9,025 torture survivors from 125 different countries receiving care in the US. On many dimensions, the patients in our study population of one clinic in Portland, Oregon mirror the characteristics of torture survivors included in this national analysis: most torture survivors came from Ethiopia and Iraq, slightly more males (53%) than females (46%) are observed, the most common types of torture were beating, threats, and witnessing of torture,

and the average reported number of types of torture was 3.5 in the NCTTP study as compared to 3.3 in our sample.

Psychiatric diagnoses in our sample population demonstrated similar prevalence of PTSD (77%) to the NCTTP findings, but our population had higher prevalence of MDD (86% compared to 52.4% from the NCTTP) and PTSD comorbid with MDD (77% compared to 35% from the NCTTP). These differences may be related to the higher percentage of refugees in our study population, as 67.6% of our population were refugees, compared to 27.5% in the NCTTP database.(5) Because our results regarding psychiatric diagnoses are similar to those of a nationwide database, we hope that our analysis of the associations between psychiatric and somatic illness can act as a basis for future research of tortured refugees and asylees on a larger scale.

Several limitations should be kept in mind when interpreting our findings. First, our study is inherently limited by its cross-sectional study design and therefore we cannot make inferences about the temporal relationship between torture and the incidence of psychiatric and somatic conditions. For example, we cannot ascertain whether patients with MDD were less likely to be employed or if those patients who are unemployed are more likely to have MDD. Statistically, we did not use a correction method such as Bonferonni to account for the multiple comparisons that we performed as this made most of our results insignificant.

Another limitation to our study is variability in the disclosure of torture experiences given that we could not control for the relationship between the patient and their case manager and physician team. As each case manager and physician team only works with one population at the IPP, we can be confident that patients in similar ethnic groups received similar care from the pool of therapies and services provided at the IPP.(30) Furthermore, the reliability across clinicians to make the same diagnosis may be inconsistent, especially considering the intricacies of presentations of psychiatric diseases between different cultures. In particular, we found that the variability in the diagnosis of "anxiety" was marked at the IPP clinic, as some physicians included anxiety as part of a PTSD diagnosis and some diagnosed each separately; consequently, anxiety was not considered to be a reliable outcome to analyze. Variability in diagnosis of chronic pain should also be mentioned as the diagnosis is based on clinical assessment rather than lab or exam tests; it is important to note that some clinicians may add chronic pain to a patient's problem list separately from other diagnoses while other clinicians may not include it because the diagnosis does not seem significant or because it may seem directly related to another psychiatric or somatic diagnosis.

There is also a possibility of underreporting of torture, whether due to stigma, to memory issues related to PTSD and/or MDD diagnoses, or to distrust.(31) In particular, we know that rape was a widely used weapon during the Bosnian War aimed at both genders. While there are not prevalence

estimates of the number of Bosnian refugees resettled to the US who were raped, per UNHCR reports, the Bosnian government estimates that at least 35,000 women are believed to be held in rape camps, but there are no estimates for the prevalence of rape among men. In our sample, only 1 male out of 35 patients (21 female and 14 male) from Bosnia reported rape. While it is possible only 1 of our patients experienced rape during the Bosnian War, it is unlikely that none of the female patients experienced rape, and thus underreporting must be considered in reviewing our study outcomes. Cultural norms, religious and social beliefs, and personal coping skills may also affect whether certain types of torture were reported. In particular, severe humiliation is the most subjective of the types of torture reviewed in this study. A report of severe humiliation could be a true experience of humiliation, but could also demonstrate an increased sensitivity to shame and guilt, which is associated with the diagnosis of MDD.

Another limitation is that the data account for the types of torture events experienced and does not ask for the patient to quantify the total number of torture events he/she has experienced. Additionally, our study does not utilize a comparison group. While a comparison group would be helpful, it is hard to find an appropriate comparison. Three ideas for comparison groups include: 1. refugees and asylees who did not report torture, 2. immigrants from other countries who did not come to the US as refugees or asylees, and 3. US citizens who are also torture victims. For this study, it was strongly considered to use refugees and asylees who did not report torture; however, underreporting is likely

so common among these groups, many patients in the “not tortured” group would have likely experienced torture.

The population of patients at the IPP clinic in Portland, Oregon likely only includes a subset of the total number of refugees and asylees in the Portland area that need psychiatric services. The Oregon Department of Human Services estimates that about 64,000 refugees have arrived in Portland since they began collecting data in 1975.(12) An accurate number of asylees is unknown. A systematic review estimated that at least 20% of all resettled refugees have a psychiatric illness, thus at least 12,800 refugees should have received mental health services since 1975.(32) There are currently 1,300 active refugees and asylees receiving care at the IPP, therefore there are likely many refugees and asylees either seeking care elsewhere or without access to care. The IPP sample of patients is likely skewed to include a patient population who are able to find and access services. As we can see from the variable “Time between arrival in US and intake,” many patients came within the first year of arrival (when refugees are offered health services by the government and subsidiaries) and then not again until at least 5 years after arrival (due to a possible delay in PTSD expression or when the patients acquired the financial and social means to access care). Additionally, over 90% of patients did not seek services at the IPP for at least 10 years from the time of first torture, and thus most of the patients in our study have been recovering from an initial torture event for at least a decade.

In future studies, it will be important to collect data on children. While studies demonstrate a significant increase in MDD and PTSD rates in children who have experienced trauma, work should be done to look at both short-term and long-term somatic and psychiatric outcomes of children experiencing torture events. In a review of 7,000 refugees resettled to Western countries, the prevalence of MDD among refugee children was found to be much higher than adults.(2) The range of ages in the sample from our particular clinic is not sufficiently wide enough to support multivariate analysis that includes children, but hopefully as data are collected on a national level by the NCTTP and other organizations, this topic can be studied further. Furthermore, following children over time to see how torture experiences and subsequent care affect outcomes at different developmental time points would be helpful.

In future studies, it would also be advantageous to look more into meditating resiliency factors. For example, studies could look at with whom the patient came to the US (family, spouse, alone); involvement with a religious organization; socioeconomic status prior to fleeing; and education level. Mediating resiliency factors may also differ by ethnicity rather than country of origin, as the experiences of ethnic groups can differ significantly depending on the nuances of the war and can affect discrimination that a population may face in the US. Ethnicity was considered in this study but not included because ethnicity was often reported to be the same as country of origin or not reported at all.

From a public health perspective, our findings support screening refugees and asylees for both psychiatric and somatic illnesses. In patients initially presenting with hypertension or chronic pain or with a recent torture event, PTSD should be strongly considered. For patients with known PTSD, screening for hypertension is particularly important. In unemployed patients, MDD should be considered.

Patients with known childhood torture events should be screened for psychosis. Patients who are known to have experienced torture or have come from a country where torture is common, should be screened for chronic somatic diseases, as the prevalence of hypertension, diabetes and chronic pain are much higher in these populations compared to the national average. While the elevated prevalence of hypertension and diabetes in our population is comparable to findings in the 2008 study by Kinzie et al., our study adds to the literature that prevalence of chronic pain is also significantly elevated among tortured refugees and asylees. Furthermore, if patients report certain types of torture, we have demonstrated that the odds of MDD are higher in those who experienced severe humiliation, the odds of PTSD are higher in those who experienced rape and beating, and the odds of psychosis are higher in those who witnessed a torture event. More generally, experience of an active or injurious form of torture is associated with higher rates of PTSD and psychosis.

With the current movement towards collaborative care, it is important to consider the psychiatric impact of torture and trauma in caring for both the initial

physical injuries and the many sequalae of these experiences. Our findings of the associations between psychiatric and somatic diagnoses add to the literature about the effects of torture on the health of refugees and asylees living in the US. Hopefully, these findings will not only help providers ensure that psychiatric and somatic issues are considered and treated together but also lead to further discussion and analyses of tortured populations.

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Appendix 1

Office of Refugee Resettlement Survivors of Torture screening survey

Services for Survivors of Torture Program

ORR-ZT-SF-PPR-B

Page 1 of 4 Pages

1.Federal Agency and Organization Element to Which Report is Submitted: Office of Refugee Resettlement	2. Federal Grant or Other Identifying Number Assigned by Federal Agency	3a. DUNS 3b. EIN **93-1176109**	4. Reporting Period End Date *(Month, Day, Year)* **09/29/2015**

B. Program Indicators

(1) Indicator Number	(2) Indicator Description	(3) Indicator	(4) # of New Clients Served During Reporting Period	(5) # of Continuing Clients Served During Reporting Period
B-01	Age when first subjected to torture	Under 5 years 5 - 13 years 14 - 17 years 18 - 24 years 25 - 44 years 45 - 64 years 65+ years Missing/unknown	___ ___ ___ ___ ___ ___ ___ ___	___ ___ ___ ___ ___ ___ ___ ___
B-02	Type of torture suffered	Beating Wounding/maiming Burning Rape and sexual torture Asphyxiation Forced postures, stretching or hanging Deprivation Sensory stress Threats and psychological Witnessing torture of others Pharmacological Dental Electrical Severe humiliation Kidnapping and disappearances Other Secondary survivor Missing/unknown	___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___	___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___
B-03	Primary complaint/presenting problem (will adjust to single complaint per person on future report)	Psychiatric/Psychological Problems Psychosis, depression, acute anxiety, PTSD Psychosocial and Environmental Problems Support system Education and/or language Occupational Housing Economic Access to health care Childcare Other	___ ___ ___ ___ ___ ___ ___ ___	___ ___ ___ ___ ___ ___ ___ ___

		Health or Medical Problems Acute (client required or requested immediate referral to a hospital or medical care provider) Non-Acute (chief complaint is medical or health-related but did not require immediate referral for evaluation and treatment) Legal Problems No legal counsel, assistance with asylum Other Missing/unknown	___ ___ ___ ___ ___	___ ___ ___ ___ ___
B-04	Sex	Male Female Other Missing/unknown	___ ___ ___ ___	___ ___ ___ ___
B-05	Immigration status at intake	Asylum Seeker Asylee or former asylee Derivative asylee Refugee or former refugee Derivative refugee Permanent resident U.S. citizen Granted Convention Against Torture Relief Other Missing/unknown	___ ___ ___ ___ ___ ___ ___ ___ ___ ___	___ ___ ___ ___ ___ ___ ___ ___ ___ ___
B-06	Age at intake	Under 5 years 5 - 13 years 14 - 17 years 18 - 24 years 25 - 44 years 45 - 64 years 65+ years Missing/unknown	___ ___ ___ ___ ___ ___ ___ ___	___ ___ ___ ___ ___ ___ ___ ___
B-07	Employment status at intake	No work authorization Unemployed, work authorized, and not seeking employment Unemployed, work authorized, and seeking employment Employed (FT/PT) with work authorization Unable to work Student Primary Caregiver Other Missing/unknown	___ ___ ___ ___ ___ ___ ___ ___ ___	___ ___ ___ ___ ___ ___ ___ ___ ___

B-08	Date of arrival in the U.S.	0 - 6 months before intake 7 - 12 months before intake 13 - 24 months before intake 25 - 36 months before intake 37 - 48 months before intake 49 - 60 months before intake 61+ months before intake Missing/unknown	____ ____ ____ ____ ____ ___ ____ ____	____ ____ ____ ____ ____ ____ ____ ____
B-09	Country of origin	Country 1 Country 2 Country 3 Country 4 Missing/unknown	**See attached** ____ ____	**See attached** ____ ____
B-10	Ethnicity	Ethnicity 1 Ethnicity 2 Ethnicity 3 Ethnicity 4 Missing/unknown	**See attached** ____ ____	**See attached** ____ ____
B-11	Religion	Buddhists Jains Confucianists Hindus Sikhs Bahais Shintoists Taoists Zoroastrians Christians Jews Muslims Nonbelievers/Agnostics Other Missing/Unknown	____ ____ ____ ____ ____ ____ ____ ____ ____ ___ ____ ___ ____ ____ ____	____ ____ ____ ____ ____ ____ ____ ____ ____ ___ ____ ___ ____ ____ ____
B-12	Housing Status at intake	Stable housing Unstable housing Homeless In ICE detention Other Missing/unknown	___ ___ ___ ___ ___ ___	___ ___ ___ ___ ___ ___
B-13	Total number of clients (surveyed)	New clients Continuing clients	___ ___	___ ___
B-14	Number of total clients served by service category (will break out new on future report)	Medical Social Mental health Legal	____ ____ ____ ____	____ ____ ____ ____
	# of community			

B-15	trainings held	Total #	____
B-16	Number of people trained by profession	Medical Social Mental health Legal Education Law Enforcement Public/Policy Non-government organization administration Religious/faith-based groups Research, evaluation and technology Other Missing/unknown	____ ____ ____ ____ ____ ____ ____ ____ ____ ____ ____ ____
B-17	Number of hours contributed by pro bono service	Medical Social Mental health Legal Information technology and research Financial and grant writing Administrative, managerial, and other professional services Missing/unknown	____ ____ ____ ____ ____ ____ ____ ____