

# Do Syrian refugees perceive improved physical and mental health a year after resettling in Canada?

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## Abstract:

We explored if self-perceived mental and physical health improved over time, what would impact this for a sample of Syrian refugees. Participants arrived in Canada between July 2015 and July 2016 and completed baseline and follow-up surveys which measured health with the RAND-36 tool. We found that physical health increased insignificantly, while mental health at follow-up was significantly higher (58.66, S.D. 11.44) than at baseline (56.81, S.D.12.12;  $t=-2.29$ ,  $df=199$ ,  $p<0.023$ ). Multivariate analysis showed that sponsorship status (GAR versus PSR) was not a significant predictor of health at follow-up.

## Introduction

Refugees often deal with many issues that increase their vulnerability to diseases during the migration process. These include the destruction of their country's health care system, living in refugee camps, and dealing with over-crowding and other sub-optimal living standards (Hassan, Ventevogel, Jefe-Bahloul, Barkil-Oteo, & Kirmayer, 2016; Kirmayer et al., 2011; Pavli & Maltezou, 2017). Migration itself is a series of events, events whose impacts are affected by time and other factors at the societal and the individual level (Bhugra, 2004). Health problems and mental health problems can thus be exacerbated prior to, during and post-migration.

Refugees are extremely resilient people and while there are diagnosed physical and mental health problems that may be higher among some (Anderson, Cheng, Susser, McKenzie & Kurdyak, 2015; Fazel, Wheeler, & Danesh, 2005; Kirmayer et al., 2011; Pavli & Maltezou, 2017), upon arrival in a host country refugees often report good self-perceived physical and mental health. It has been suggested that these high levels of perceived good health are related to relief and reduction of stress, the hope of a better future and freedom from more trauma and violence (Kirmayer et al., 2011). There seems to be contradictory evidence about whether health increases or decreases among refugees over time in Canada. For some refugees it seems that their better health tends to recede as post-migration factors begin to affect their lives (Kirmayer et al., 2011). Other research has found that refugees report better self-reported health within a few years of arrival (Maximova & Krahn, 2010).

Previous Canadian refugee research focuses on health change after a few years; there does not seem to be any Canadian research that examines the trajectory for health within the first year or two after arriving in a new country. One Australian study examined psychological symptoms among refugees within their first two years (Steel et al., 2011). The authors of this study were comparing refugees who were initially detained upon arrival in Australia with a group of refugees who were granted permanent protection. They found that self-perceived psychological distress (GHQ-30) decreased in the group granted protection, and increased in the group that was detained (Steel et al., 2011). This work does seem to indicate an improvement in self-perceived mental health among refugees who were not detained, although the significance in change is in comparison to the detained population.

We wanted to explore whether self-reported health has improved or deteriorated among a sample of Syrian refugees who arrived during a large wave of Syrian refugee resettlement in Canada between July 2015 and July 2016. Resettled refugees in Canada arrive with landed immigrant status and receive settlement and financial support through two major pathways. Government Assisted Refugees (GARs) are supported by the federal government and settlement agencies. Privately Sponsored Refugees (PSRs) receive their financial and settlement support through private citizens or organizations. A small number of refugees are resettled through a mixture of private and government support (Blended Visa Office Referred; BVORs). We hypothesized that levels of self-perceived physical health and mental health would be higher at follow-up as compared to baseline study results (Oda et al., 2017). We also hypothesized that any differences in self-perceived health between GARs and PSRs noted at baseline would disappear at follow-up when adjusted by other factors.

## Methods

### Participants

We conducted an original study with 400 Syrian refugees who entered Canada between July 2015 and July 2016 (Oda et al., 2017). Our original sample was recruited through flyers, direct referrals and snowball techniques.

The current study targeted half (n=200) of the original study sample. We randomized the potential list of participants, from those who consented to be contacted from the original study, so that it was equally split by sponsorship status and gender. All of those contacted agreed to participate. In total, 200 Syrian refugees provided responses to the questions; which included 100 GARs and 100 PSRs.

### **Materials**

All questions used in this study were either professionally translated into Arabic or were asked in Arabic at interview by a trained Research Assistant fluent in both English and Arabic. Respondents were asked demographic questions and questions about their pre-migration experiences. We also aimed to capture factors (for example level of support in Canada, discrimination and language ability) that may affect the risk of mental and physical health and health service usage.

The participants were asked the 36-items of the RAND health survey [RAND-36] (Coons, Alabdulmohsin, Draugalis, & Hays, 1998) in both the original and the follow-up studies, and questions on health care usage and access from the Canadian Community Health Survey [CCHS] (Statistics Canada, 2014). At follow-up we added questions on cigarette and alcohol use, the Multidimensional Scale of Perceived Social Support [MSPSS] (Zimet, Dahlem, Zimet, & Farley, 1998) and the Everyday Discrimination Scale [EDS] (Williams, Yu, Jackson, & Anderson, 1997). We also captured information about their experiences pre-migration to Canada (e.g., being in a refugee camp) and about their socio-demographic situation and supports in Canada (e.g., language acquisition, employment, and income).

### **Dependent Variables**

The RAND-36 includes both a physical and mental health summary score that are derived from eight scales that are calculated from the 36 questions of the tool (Hays, Sherbourne, & Mazel, 1993). Following the recommended method (Hays et al., 1993) we calculated the raw scores, which range from 0-100, for each scale: 1) physical functioning; 2) bodily pain; 3) role limitations due to physical health problems; 4) general health perceptions; 5) role limitations due to personal or emotional problems; 6) general mental health; 7) social functioning; and 8) energy/fatigue. The raw scores are transformed to a normalized and standardized t-score using the Item Response Theory (IRT) method to apply relative item weights within each scale and item response weights within each item simultaneously (Hays, Prince-Embury, & Chen, 1998). The composite summary scores are then calculated by adding the product of each contributing scale t-score which was multiplied by its beta weight (Hays et al., 1998). Higher scores represent better mental or physical health.

#### **Missing values for RAND-36**

In two circumstances, one response value was not provided by participants at follow-up. We adhered to the recommended method by Hays et al. (1998, pp. 55) to estimate the IRT weight of the missing response to calculate the standardized t-score for the corresponding scale.

The composite t-scores for physical and mental health were calculated at the baseline interview and again at follow-up.

### **Independent Variable**

Sponsorship Status was based on self-identification by the participants at baseline as to whether they were Government Assisted Refugees (GARs) or Privately Sponsored Refugees (PSRs).

### **Other Variables**

We found that there was a high degree of homogeneity in responses to a number of the questions and therefore we were unable to use them to determine if there was a relationship between some aspects of migration (e.g. being in a refugee camp) and post-migration and self-perceived mental or physical health.

Variables that were collected during baseline interview that were included as control measures and pre-migration factors included gender (female or male), age (18-29, 30-49, 50+), educational attainment (less than high school, or high school graduate and better) and the participant's physical or mental health composite score from baseline. Participants were asked at the follow-up interview how many children they had and this was included as a scale variable.

During the follow up interview we asked participants about their current employment status and the affordability of

their housing as measures of socio-economic status after migration to Canada. Employment was dichotomized as either having a paid position, or no paid employment. We also asked participants whether they felt that the housing they were in was affordable or not.

Being able to converse with your healthcare provider is one of the biggest potential barriers to care (Mental Health Commission of Canada [MHCC], 2016) and may therefore reduce refugees' perceived wellness if they do not seek or receive adequate care. Permanent residents (which include refugees) have access to no cost language classes, which are funded by the government of Canada. To determine perceived ability to understand English we asked participants how often they needed an interpreter for appointments (always, sometimes, or never).

We defined a current smoker as someone who ever reported smoking a full cigarette and were presently smoking occasionally or daily in response to the CCHS question "At the present, do you smoke cigarettes daily, occasionally or not at all?" Any cigarette use, even light or intermittent, is considered to carry significant physical health risks (Schane, Ling, & Glantz, 2010) and was included in our regression models for both self-perceived physical and mental health.

Length of residency was calculated for each participant based on the date of arrival that they provided during the baseline interview and the date of the follow up interview. The length of time in Canada was determined in days and is a scale measure.

Everyday discrimination scale [EDS] (Williams et al., 1997) – The everyday discrimination scale attempts to measure chronic, routine, and relatively minor experiences of unfair treatment through nine items. Discrimination has been shown previously to have a significant impact on the mental health of refugee and immigrant populations (Ellis et al., 2010; Hatch et al., 2016; Noh, Beiser, Kaspar, Hou & Rummens, 1999; Noh & Kaspar, 2003). Our participants were asked to respond to the EDS standard questionnaire, however, the variable was dichotomized (any discrimination reported, no discrimination reported) due to the infrequency of positive responses.

Multidimensional Scale of Perceived Social Support [MSPSS] (Zimet et al., 1998) – The MSPSS is an inventory of 12 items that measures subjective social support. The MSPSS also has three sub-scales that measures support from three sources: family, friends, and significant others. Only the friends' sub-scale was used in the regression analyses as the full MSPSS scale, and specifically the family and significant other subscales, were peaked with little variability.

Social connections were measured through two open ended questions: how many people in this city would you call your friend, and how many of your friends in this city do you feel emotionally close to? The responses to the questions were skewed and as a result it was decided to transform these scales into categories. The question about the number of friends was collapsed into three categories: zero to nine friends, ten to nineteen friends, and twenty or more friends. The question about how many friends participants have in the city that they are emotionally close to was collapsed into four categories: zero friends, one friend, two friends, and three or more friends.

## **Analysis**

All analyses were conducted using SPSS 24.0. We first offer a general description of the sample to provide some context around the pre-migration experiences, English ability, access to primary health care services and acceptance in Canada. We next analyzed the associations (ANOVA and independent samples t-test) between mental health and physical health, sponsorship status and other key variables. Pearson's r correlations were run to test the univariate relationship between the two dependent scales (physical and mental health) and the other scale variables.

To test whether sponsorship stream was related to the self-perceived physical and mental health scores at follow-up we used linear regression models. These models were adjusted by the demographic characteristics (gender, age, education, and number of children), the presence of a disability or chronic illness, current smoker [yes/ no] and post-migration factors (length of time in Canada, employment, employment support, affordable housing, need for an interpreter [reference: always], everyday discrimination, MSPSS friends scale measure as a scale, number of friends in the city [0-9, 10-19, 20+], and the number of friends emotionally close [none, one, two, three or more]).

We analyzed the sample in our current study against those who were not selected from the original study to see if there were any significant differences in the profiles of participants and to identify potential biases. We found no significant differences in age, educational attainment, having seen a doctor at baseline or their baseline self-reported

RAND-36 physical and mental health summary scores between those who were participated in the follow up study and those from the original sample that were not included in the follow-up study. However, our follow-up sample participants were less likely to report having a chronic illness or disability at baseline, were more likely to report having a family doctor at baseline and had been in Canada on average 13 days longer at the time of the baseline interview than refugees who were not selected to participate.

### **Ethics**

Ethics approval was obtained to conduct this research from the Centre for Addiction and Mental Health Research Ethics Board and Administrative Approval was received from the Office of Research Ethics at the University of Toronto and from the Human Participants Research Committee ethics review board of York University.

### **Funding**

This research was funded by the Social Sciences and Humanities Research Council of Canada.

## **Results**

### **Sample Characteristics**

We interviewed slightly more females (n=106) than males (n=94). Our sample was on average 39 years old (range 18 to 80; S.D. 14.89) and had been in Canada on average 456 days (S.D. 74.50).

Before coming to Canada the last country participants resided in was Jordan (n=56), Lebanon (n=124) or Turkey (n=20). All 100 of the privately sponsored refugees last resided in Lebanon before coming to Canada. Only 38 of the sample spent time in a refugee camp and all of participants who did so were sponsored to come to Canada through the GAR program.

When asked about English ability, 38 per cent rated their ability to be excellent, very good or good speakers of English, however, 70 per cent of participants indicated that they would need an interpreter sometimes or always for appointments. At the time of the follow-up 19 participants reported not having taken any of the government sponsored English classes.

All of our participants reported having a family doctor at follow-up and only 21 reported not seeing their family doctor since the baseline interview.

Thirty-five per cent of participants reported having smoked at least one cigarette in their life, but only 25 per cent reported currently smoking daily or occasionally. Drinking during the past 12 months was reported by 28.5 per cent of participants (almost all were PSRs), but use of alcohol occurred rarely with only 8.8 per cent of participants drinking alcohol as frequently as once a week or more.

Participants were asked about how respected or welcomed they were by Canadians and whether they knew where to access certain services. The participants reported high levels of acceptance in Canada, 95 per cent of participants said that they were welcomed and accepted usually or almost always by Canadians, and 98.5 per cent said that they felt Canadians treated them with respect usually or almost always.

### **Self-Perceived Physical Health**

The RAND-36 self-perceived physical health composite score for our sample of Syrian refugees was slightly higher at follow-up (58.27, S.D. 10.52), but not significantly different than baseline (58.08, S.D. 10.35;  $t=-0.43$ ,  $df=199$ ,  $p=0.665$ ). The physical health score at follow up was significantly positively correlated with baseline physical health scores ( $r=0.61$ ,  $p<0.001$ ) and MSPSS friends sub-scale ( $r=0.183$ ,  $p=0.009$ ). It was not significantly correlated with the length of time participants had been in Canada ( $r=0.03$ ,  $p=0.682$ ). Physical health score at follow up was significantly negatively correlated with the number of children participants' had ( $r=-0.32$ ,  $p<0.001$ ).

Associations (see table 1) were found to be statistically significant between the physical health score at follow-up and participants who reported a chronic illness or disability at baseline, their educational attainment, their sponsorship stream, their requirement of an interpreter at appointments, having paid employment, and the affordability of their housing.

Table 2 shows the results of linear regression models of the RAND-36 physical health composite scores at follow-up. Sponsorship status by itself is significantly related to physical health at follow-up, with PSRs reporting scores that are 6.13 points higher (model 1). In model 2, pre-migration factors and health at baseline are considered. In this case, PSRs report significantly higher scores by 4.86 points. Physical health at baseline is also significantly related to physical health at follow-up; for every point higher in physical health score at baseline, there is a significant increase in the physical health score at follow-up by 0.51 points. When we add post-migration factors into model 3, sponsorship status is no longer a statistically significant predictor ( $p=0.054$ ) of physical health at follow-up. In the final model only physical health at baseline is a significant factor in predicting the physical health score at follow-up.

### Self-Perceived Mental Health

The average mental health score at follow-up was nearly 2 points higher (58.66, S.D. 11.44) and significantly different than the mental health score from baseline (56.81, S.D.12.12;  $t=-2.29$ ,  $df=199$ ,  $p<0.023$ ). The mental health score at follow-up was significantly positively correlated with the mental health score at baseline ( $r=0.53$ ,  $p<0.001$ ), and with MSPSS friends sub-scale scores ( $r=0.27$ ,  $p<0.001$ ). The mental health score at follow-up was not significantly correlated with length of time in Canada ( $r=-0.04$ ,  $p=0.564$ ) or with the number of children that participants had ( $r=-0.004$ ,  $p=0.959$ ).

Associations (see table 3) were found to be statistically significant between the mental health score at follow-up and reporting a chronic illness or disability at baseline, their requirement of an interpreter at appointments, having paid employment, and experiences of everyday discrimination. There was no statistically significant relationship between the mental health score and sponsorship status.

Table 4 shows the results of the linear regression models of the RAND-36 mental health composite score at follow-up. In model 1, sponsorship by itself is not a significant predictor of the mental health score at follow-up. When we factor in pre-migration factors and mental health score at baseline (model 2), only the mental health at baseline is significant. Every point increase in mental health score at baseline corresponds to an increase in the mental health score at follow-up by 0.48 points ( $p<0.001$ ). Adding post-migration factors into model 3, the results show that only mental health at baseline and MSPSS friends sub-scale are predictors of mental health at follow-up. Adjusting for the other variables, every increase in mental health score at baseline increases the mental health score at follow-up by 0.44 points ( $p<0.001$ ). For every point increase on the friends MSPSS sub-scale, the mental health score at follow-up increases by 1.40 points ( $p=0.008$ ), when adjusted by the other factors.

## Discussion

Our results indicate that there is little difference in the health and mental health in our sample of Syrian refugees to Toronto 12-13 months after their baseline scores from when they first arrived in Canada. Our sample had better physical and mental health than a comparison USA population. The RAND-36 (Hays et al., 1998) considers that mental and physical health composite t-scores above 53 are high, because 53.2% and 54.2%, of their age-stratified normative sample had mental and physical health scores of 53 or lower. Individuals above 53 are considered unlikely to perceive that either their physical or mental health problems impede their life functioning (Hays et al., 1998). As more than 50% of our sample received scores higher than this 53 cut off (physical health median t-score at follow-up = 62.20, mental health median t-score at follow-up = 60.19) it could be concluded that the majority of our sample of Syrian refugees perceive their health as better than the US normative average.

Sponsorship status appears to be a factor in the univariate analysis in self-perceived physical health, but not mental health. However, this difference was not present once post-migration factors are considered in the model for predicting physical health. The differences we found may be because the Canadian Government actively sought to resettle the most vulnerable as Government Assisted refugees (GARs) during this initiative and thus they are more likely to have higher needs and a greater complexity of health problems than Privately Sponsored Refugees (Immigration, Refugees, and Citizenship Canada [IRCC] 2016a, 2016b). However, after time in Canada, post-migration factors appear to be important in influencing self-perceived physical health. Post-migration factors such as employment, housing, and relationships appear to make up some of the difference in the lower self-perceived physical health that Syrian GARs report. This produces a result in our final model that health at baseline is the only

factor that significantly predicts self-perceived physical health. As self-perceived health at baseline increases this predicts an increase in self-perceived health at follow-up.

Perceived social support from friends as measured by the MSPSS, when adjusted by other factors, showed that the more social support that the Syrian refugees felt they had from friends the better their self-perceived mental health. Being alone or feeling like you lack people who can provide support is associated with poorer mental and physical health. Refugees in many cases have lost their families and friends, they've come to a new place, often they do not speak the language and now they are dealing with the consequences of the terror and violence that they fled. Previous research has clearly shown that having support, and feeling like you have people who you can speak to; can help reduce mental health problems in general populations and even amongst immigrant groups (Klineberg et al., 2006; Olagunju, Olutoki, Ogunnubi, & Adeyemi, 2015; Ponizovsky & Ritsner, 2004; Santini et al., 2016; Schwarzback, Lupp, Forstmeier, König & Riedel-Heller, 2014; Stice, Ragan & Randall, 2004; Tural, Onder & Aker, 2012). While the previous work points to social support from friends, family and significant others as key in better mental health, the lack of variability in the other MSPSS measures means that we were not able to examine how they influence the mental health of the refugees in our study. Despite this, the Syrian refugees in our sample reported having strong social support from all three groups. They reported having multiple friends in the city, and the majority report having at least one friend with whom they are emotionally close. Social integration and satisfaction with the support provided by friends has been important in other migrant populations in reducing loneliness and distress (Ponzovsky & Ritsner 2004). Social support has been shown to help reduce suicidal ideation (Rowe et al. 2006), and people who have large social networks have been found to have a reduced risk of death (Dalgard & Håheim 1998; Pennix et al., 1997; Seeman, 1998). Other research on the impact of post-migration factors on mental health suggests that social isolation is a consistent predictor of poor mental health outcomes (Hynie, 2018). Our results are important as the refugees we surveyed are reporting strong networks. They have felt welcomed by Canadians and have social connections with people (family and friends) who they are emotionally close to. These connections are promising for their long term mental well-being.

### **Limitations**

Caution needs to be taken when trying to extrapolate these findings to other refugee populations. The crisis in Syria led the Canadian government to put extra measures and resources in place to ensure that the welcome Syrian refugees received would put them in a good starting place. The convenience sample that we used may have also resulted in some bias in our results. The measures of physical and mental health are based on self-perception rather than any clinical measure or diagnosis. Therefore, participants may be experiencing health problems but they may not feel that their health is poor, or that it has worsened, regardless of living with any actual diagnosed health problems.

### **Conclusions**

In conclusion, the Syrian refugees in our sample report high rates of good physical and mental health both when they first arrived in Canada and about two years after arrival. In fact, their rates are higher than general US populations and have increased on average since first arrival. Similar to previous research, our results show that post migration factors are key to good health for refugees, especially making social connections. Refugees often deal with loss of family, loss of friends and loss of identity during their migration. Making strong connections in their new home may help to mitigate the impact of these losses and support good mental health. Providing refugees with a 'warm' welcome and having a support system in place helps them to better integrate into their new lives and support their long term health outcomes

**Table 1:** Description of sample of Syrian refugees by average RAND-36 physical health score at follow-up

Variable	Physical Health Score (SD)	Measure	Significance
<b>Baseline Variables</b>			
Female (n=106) Male (n=94)	58.845 (±9.983) 57.929 (±11.106)	t=0.614	p=0.540
Age: 18-29 (n=61) Age: 30-49 (n=90) Age: 50+ (n=49)	60.353 (±10.370) 58.482 (±10.316) 55.877 (±10.712)	F=2.505	p=0.084
Sponsorship GAR (n=100) Sponsorship PSR (n=100)	55.440 (±11.463) 61.389 (±8.528)	t=-4.164	p<0.001
Education Less than High school (n=104) Education High School or better (n=96)	55.747 (±10.819) 61.304 (±9.392)	t=-3.865	p<0.001
Disability or chronic illness: Yes (n=43) Disability or chronic illness: No (n=157)	51.704 (±11.024) 60.252 (±9.610)	t=-5.003	p<0.001
<b>Follow-up Variables</b>			
How often do you require an Interpreter: Always (n=57) How often do you require an Interpreter: Sometimes (n=84) How often do you require an Interpreter: Never (n=59)	53.275 (±11.787) <sup>b,c</sup> 58.649 (±9.673) <sup>a,c</sup> 63.046 (±7.937) <sup>a,b</sup>	F=14.242	p<0.001
Current smoker: Yes (n=50) Current smoker: No (n=150)	57.272 (±11.696) 58.796 (±10.096)	t=0.887	p=0.376
Paid Employment: Yes (n=58) Paid employment: No (n=142)	63.362 (±7.003) 56.394 (±11.039)	t=4.452	p<0.001
House Affordable: Yes (n=73) House Affordable: No (n=124)	60.399 (±9.781) 57.012 (±10.771)	t=2.204	p=0.029
Everyday discrimination reported: No (n=172) Everyday discrimination reported: Yes (n=28)	58.521 (±10.574) 57.756 (±10.263)	t=0.357	p=0.721
Friends in city: 0-9 (n=79) Friends in city: 10-19 (n=59) Friends in city: 20+ (n=62)	57.587 (±11.055) 58.000 (±11.456) 59.873 (±8.718)	F=0.890	p=0.412
Emotionally close friends: none (n=56) Emotionally close friends: one (n=36) Emotionally close friends: two (n=37) Emotionally close friends: three or more (n=71)	58.120 (±10.595) 58.900 (±9.998) 58.664 (±9.573) 58.167 (±11.326)	F=0.075	p=0.973

<sup>a,b,c,d</sup> Denotes significant difference between responses at p<0.05



**Table 2:** Linear regression for physical health composite score at follow-up

Variable	Model 1			Model 2			Model 3		
	B	SE	Sig.	B	SE	Sig.	B	SE	Sig.
Intercept	49.055	2.276	<0.001	20.354	4.808	<0.001	22.148	7.311	0.003
Sponsorship	<b>6.131</b>	<b>1.437</b>	<b>&lt;0.001</b>	<b>4.864</b>	<b>1.691</b>	<b>0.004</b>	3.701	1.904	0.054
Gender				-0.254	0.601	0.674	-0.465	0.719	0.519
Age				-1.332	1.087	0.222	-0.741	1.153	0.521
Education				0.406	1.316	0.758	0.231	1.588	0.885
Disability				2.471	1.746	0.159	2.413	1.808	0.184
# of Children				0.191	0.447	0.669	0.145	0.456	0.751
RAND-36 PHC T1				<b>0.511</b>	<b>0.069</b>	<b>&lt;0.001</b>	<b>0.482</b>	<b>0.071</b>	<b>&lt;0.001</b>
# of days in Canada							-0.001	0.008	0.865
Interpreter							0.815	1.131	0.472
Current smoker							0.846	1.599	0.598
Employed							-0.670	1.656	0.686
Affordable Housing							-1.655	1.289	0.201
Discrimination							-0.073	1.836	0.968
MSPSS Friends scale							0.897	0.459	0.052
# of friends in city							0.746	0.795	0.349
# of friends emotionally close to							-0.883	0.598	0.142
Df	(1, 195)			(6, 189)			(9, 180)		
R <sup>2</sup> /Adj. R <sup>2</sup>	0.085/0.081			0.416/0.394			0.444/0.394		
F	18.201			19.232			8.969		
Significance	<0.001			<0.001			<0.001		

**Table 3:** Description of sample of Syrian refugees by average RAND-36 mental health score at follow-up

Variable	Mental Health Score (SD)	Measure	Significance
<b>Baseline Variables</b>			
Female (n=106) Male (n=94)	57.486 (±11.102) 59.988 (±11.733)	t=-1.549	p=0.123
Age: 18-29 (n=61) Age: 30-49 (n=90) Age: 50+ (n=49)	58.310 (±11.802) 57.417 (±11.398) 61.386 (±10.826)	F=1.968	p=0.142
Sponsorship GAR (n=100) Sponsorship PSR (n=100)	57.330 (±11.961) 59.994 (±10.796)	t=-1.654	p=0.100
Education Less than High school (n=104) Education High School or better (n=96)	57.624 (±11.887) 59.786 (±10.890)	t=-1.338	p=0.182
Disability or chronic illness: Yes (n=43) Disability or chronic illness: No (n=157)	54.733 (±12.167) 59.738 (±11.034)	t=-2.577	p=0.011
<b>Follow-up Variables</b>			
How often do you require an Interpreter: Always (n=57) How often do you require an Interpreter: Sometimes (n=84) How often do you require an Interpreter: Never (n=59)	56.044 (±12.432) <sup>c</sup> 58.209 (±11.861) 61.836 (±9.021) <sup>a</sup>	F=3.941	p=0.021
Current smoker: Yes (n=50) Current smoker: No (n=150)	58.797 (±11.713) 58.256 (±10.692)	t=0.289	p=0.773
Paid Employment: Yes (n=58) Paid employment: No (n=142)	61.480 (±10.266) 57.511 (±11.730)	t=2.248	p=0.026
House Affordable: Yes (n=73) House Affordable: No (n=124)	60.302 (±10.339) 57.547 (±12.017)	t=1.635	p=0.104
Everyday discrimination reported: No (n=172) Everyday discrimination reported: Yes (n=28)	59.432 (±11.216) 53.931 (±11.888)	t=2.387	p=0.018
Friends in city: 20+ (n=62) Emotionally close friends: none (n=56) Emotionally close friends: one (n=36)	57.672 (±11.792) 57.421 (±12.158) 61.102 (±9.998)	F=2.075	p=0.128
Emotionally close friends: two (n=37) Emotionally close friends: three or more (n=71) How often do you require an Interpreter: Always (n=57) How often do you require an Interpreter: Sometimes (n=84)	55.382 (±12.282) 58.982 (±9.757) 59.274 (±11.002) 60.767 (±11.423)	F=2.431	p=0.066

<sup>a,b,c,d</sup> Denotes significant difference between responses at p<0.05

**Table 4:** Linear regression for mental health composite score at follow-up

Variable	Model 1			Model 2			Model 3		
	B	SE	Sig.	B	SE	Sig.	B	SE	Sig.
Intercept	54.675	2.579	<0.001	22.457	4.951	<0.001	28.569	7.787	<0.001
Sponsorship	2.591	1.629	0.113	0.610	2.004	0.761	-0.213	2.172	0.922
Gender				0.728	0.713	0.308	0.767	0.825	0.354
Age				2.076	1.279	0.106	1.986	1.316	0.133
Education				0.989	1.573	0.521	-0.287	1.805	0.874
Disability				3.305	1.924	0.087	2.137	1.932	0.270
# of Children				0.531	0.521	0.309	0.466	0.516	0.368
RAND-36 MHC T1				<b>0.481</b>	<b>0.061</b>	<b>&lt;0.001</b>	<b>0.445</b>	<b>0.062</b>	<b>&lt;0.001</b>
# of days in Canada							-0.017	0.010	0.072
Interpreter							1.295	1.297	0.319
Current smoker							-0.531	1.827	0.772
Employed							0.227	1.896	0.905
Affordable Housing							-2.159	1.471	0.144
Discrimination							-3.149	2.101	0.136
MSPSS Friends scale							<b>1.397</b>	<b>0.523</b>	<b>0.008</b>
# of friends in city							1.105	0.907	0.225
# of friends emotionally close to							0.042	0.681	0.951
Df	(1,195)			(6,189)			(9, 180)		
R <sup>2</sup> /Adj. R <sup>2</sup>	0.013/0.008			0.320/0.295			0.391/0.336		
F	2.530			12.733			7.212		
Significance	0.113			<0.001			<0.001		

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