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Determinants of resource needs and utilization among refugees over time

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Abstract

Purpose This study examined refugees' resource needs and utilization over time, investigated the relationships between pre-displacement/socio-demographic variables and resource needs and utilization, and explored the role of resource needs and utilization on psychiatric symptom trajectories.

Methods Iraqi refugees to the United States ($N = 298$) were assessed upon arrival and at 1-year intervals for 2 years for socio-demographic variables and pre-displacement trauma experiences, their need for and utilization of 14 different resources, and PTSD and depressive symptoms.

Results Although refugees reported reduction of some needs over time (e.g., need for cash assistance declined from 99 to 71 %), other needs remained high (e.g., 99 % of refugees reported a need for health care at the 2-year interview). Generally, the lowest needs were reported after 2 years, and the highest utilization occurred during the first year post-arrival. Pre-displacement trauma exposure predicted high health care needs but not high health care utilization. Both high need for and use of health care predicted increasing PTSD and depressive symptoms. Specifically, increased use of psychological care across the three measurement waves predicted more PTSD and depression symptoms at the 2-year interview.

Conclusions Differences emerged between need for and actual use of resources, especially for highly trauma-exposed refugees. Resettlement agencies and assistance programs should consider the complex relationships between resource needs, resource utilization, and mental health during the early resettlement period.

Keywords Refugees · Resource need · Resource utilization · PTSD · Depression

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Introduction

Between 2008 and 2010, more than 50,000 refugees entered the United States from Iraq, accounting for 25 % of all new refugees to the US [1]. Iraqi refugees arrive in the US after being displaced from a war-torn country that has consistently been rated as one of the worst offenders for human security and safety worldwide [2], and often flee their homes with few personal belongings and few monetary and social resources [3].

Previous cross-sectional research has found that refugees report a high need for physical and mental health care [4–8], financial support [5, 7], translation/language assistance [6, 8], and aid in securing safe housing [3]. Throughout this article we refer to these as institutional resources. To our knowledge, no study has examined how refugees' resource needs—and utilization of those resources—actually change over time, especially in the first few years post-arrival. Such knowledge would allow for targeted screening of refugees to identify those with high resource needs, a better understanding of how refugees utilize available resources during the early resettlement period, and more efficient allocation of limited government and community funds.

Predicting resource needs and utilization after arrival

Previous studies, although limited by cross-sectional designs, suggest that the longer refugees are in transitional limbo during the asylum period, the worse their post-settlement physical and mental health [9]. Previous studies also indicate that refugees who experience serious or numerous pre-displacement traumatic events experience poorer mental and physical health in the host country [10, 11]. Poorer health and quality of life should be associated with higher institutional resource needs post-arrival, especially in health care. To date, however, no longitudinal research has specifically examined the impact of such pre-displacement and other socio-demographic variables on resource need and utilization during the early post-arrival period.

Institutional resources and mental health

Refugees report a need for social, financial, and health care services upon arrival to the host country [4–7]. Although some of these needs stem from pre-displacement events (e.g., torture), which prompt the need for health care [10, 11], other needs such as language training result simply from arriving in a new environment [8]. Regardless of the origin of the need, cross-sectional research indicates that refugees who have the worst mental and physical health upon arrival to the host country also simultaneously have the highest institutional resource needs. For example, a meta-analysis found that refugees who needed permanent housing in the host country had poorer mental health than refugees who had secured permanent housing [12]. A longitudinal examination of how resource needs change over time and the relationship of these changes to mental health changes could clarify the potential causal pathways.

It is important to remember that the need for institutional resources differs from their use or utilization. If high

resource needs are associated with poor mental health, does increasing utilization of these needed resources improve mental health? Cross-sectional research by Maximova and Krahn [13] found that refugees in Canada who received the highest number of resettlement services in the first years post-arrival had better mental and physical health. These authors suggested that the use of many different types of resources beyond mental health or physical health services, such as language services, housing subsidies, and so on may improve refugees' mental health during the post-arrival period. Use of job training services, for example, may not directly impact mental health, but the use of these services may lead to securing gainful employment, which could foster better mental health [12]. The utilization of other institutional resources may follow a similar pattern. For example, the use of language services should contribute to increased acculturation and lower acculturative stress and, therefore, better mental health. It is important to note, however, that all research on this topic has been cross-sectional and retrospective, with refugees reflecting on their resource use up to 3 years earlier [13]. As with resource needs, the causal relationship between resource utilization and mental health is not known, but the available cross-sectional research suggests that refugees who use the most resources in the early post-arrival period have better mental health than those who use fewer resources.

Overview of the present study

Refugees arrive in the host country with few resources, but there is little understanding of how their need for and use of institutional resources changes during the early post-arrival period. Similarly, refugees enter the host country with different socio-demographic characteristics and pre-displacement experiences, yet it is unclear how these factors are connected to overall resource need and use once in the host country. Finally, refugees often report mental and physical health problems upon arrival in the host country; however, it is unclear how resource needs and utilization are connected to changes in mental health during the post-displacement period. This study, therefore, had several aims.

Aim 1

Examine changes in institutional resource needs and utilization over 2 years in a newly arrived refugee sample.

Aim 2

Explore the relationships of pre-displacement variables (i.e., trauma exposure and transition time to the US) and socio-demographic variables (i.e., age, gender, education,

marital status, living situation, and functional English) to institutional resource need and utilization across the 2-year period. We hypothesized that previously identified predictors for poor health, specifically high pre-displacement trauma exposure and longer transition time to the US, would be associated with increased need for medical care and psychological care.

Aim 3

Investigate the role of institutional resource need and utilization on mental health in the post-arrival period. We hypothesized that higher institutional resource needs would be associated with more symptoms of PTSD and depression 2 years post-arrival, whereas higher institutional resource utilization would be associated with fewer symptoms 2 years post-arrival.

Methods

Participants and procedures

Data were collected from 298 adult Iraqi refugees randomly selected for participation from the population of Iraqi refugees who arrived in southeast Michigan between October 2011 and August 2012.

Recruitment and selection

Participants were recruited with the collaboration of three resettlement agencies in metropolitan Detroit. A contact person at each agency informed the research team when orientation meetings were scheduled with newly arrived refugees. An Arabic-speaking member of the research team attended each meeting and presented information about the study. Refugees who were interested in participating provided contact information. A computer-generated random sample of 50–70 % of those who were interested was selected each week. In total, out of 501 interested and eligible refugees, 306 people (61 %) were randomly selected for inclusion. These individuals were contacted by a member of the research team and given both oral and written information about the study; almost all of them ($n = 298$; 98 %) participated.

Interviews

A bilingual Arabic–English psychiatrist conducted face-to-face structured interviews in the participants' homes, workplaces, community organizations, or other community locations. Refugees were interviewed three times. The first

(baseline) interview occurred very soon after the refugees' arrival in the US ($M_{\text{months in US}} = 1.00$, SD 1.08, range <1–5.40 months). The 1-year interview occurred nearly 1 year after their arrival ($M_{\text{months in US}} = 12.51$, SD 1.12, range 10.73–16.63 months). The 2-year interview occurred, on average, nearly 2 years after arrival to the US ($M_{\text{months in US}} = 24.85$, SD 1.35, range 22.13–28.13 months).

The study was approved by the Human Investigation Committee at Wayne State University, Detroit, Michigan. Participants provided informed consent prior to the baseline interview. All participants received \$35 compensation for their participation in the baseline and 1-year assessment and \$70 for participation in the 2-year assessment.

Measures

With the exception of the pre-displacement trauma measure, which was already available in Arabic, all items and measures were translated from English to Arabic, and then back translated from Arabic to English to ensure accurate translation.

Socio-demographic variables

The following were assessed at baseline: age, gender, education (less than high school vs. high school or greater), marital status, living situation (living with core family vs. alone), and transition time to the US (i.e., length of time between leaving Iraq and arriving in US).

Pre-displacement trauma exposure

At baseline, participants responded either “Yes” or “No” to the traumatic event component of the Harvard Trauma Questionnaire (HTQ), Arabic version [14], regarding whether or not they had experienced each of 39 events before coming to the US, including “lacked shelter”, “witnessing execution of civilians”, or “witnessed desecration of religious shrines or places of religious instruction”. Responses were summed to create an HTQ cumulative trauma sum score, which ranged from 0 to 39.

Functional English

Consistent with prior research [5], functional English language ability was assessed by a single item, “I feel that my English language skills are good enough for me to function in everyday US life”, which participants rated on a scale from 1 (strongly disagree) to 5 (strongly agree). Functional English language ability was assessed at the 2-year interview only.

Institutional resource needs and utilization

Refugees' needs for and utilization of institutional resources were assessed using a 14-item checklist, with participants responding "Yes" or "No" as to whether they (a) needed, and (b) utilized resources in specific areas. At baseline, participants were asked whether they had needed or utilized each resource "since arriving in the US." At the 1- and 2-year interviews, participants were asked if they had needed or utilized each resource within the past year. Prior to being asked if they needed each resource, participants were asked if they were aware of the resource, and if not, they were provided a description of the resource (e.g., "Bridge Card for food benefits is a program that offers a certain amount of money each month in order to purchase food."). Both needs and utilization were assessed at each time point. To examine change over time, the 14 items were treated individually. The 14 items were also categorized into five areas: immigration services, family care services, cash/subsidized assistance, job training, and health care. For each category, items were summed to create a score representing cumulative need and utilization across the three measurement waves (e.g., total need for immigration services across the three interviews).

PTSD symptoms

These were assessed at each time point using the 17-item PTSD Checklist (PCL)—Civilian version [15, 16]. The PCL items mirror the re-experiencing, avoidance, and hyperarousal symptoms of PTSD listed in *DSM-IV-TR*. Participants indicated on a 5-point scale how much they were bothered by each symptom in the past month. Scores could range from 17 to 85, with higher scores indicating higher PTSD symptoms. Internal consistency (Cronbach's alpha) for the PCL in this study was .91 at baseline, .94 at 1-year interview, and .87 at 2-year interview.

Depressive symptoms

These were assessed at each time point using the 7-item depression subscale of the Hospital Anxiety and Depression Scale (HADS) [17]. Items were rated on a 4-point scale, with higher scores indicating higher depression symptoms (possible range 0–21). Cronbach's alpha was .93 at the baseline and 2-year interviews and .94 at the 1-year interview.

Data analyses

Attrition over time was low. Seven participants were lost from baseline to 1-year (97.7 % retention rate), and only five additional participants were lost from 1 to 2-year

($n = 286$, 96.0 % retention rate over the three measurement waves). Also, some participants did not answer all questions, which resulted in small amounts of missing data, with $n = 264$ being the smallest sample size analyzed.

To examine changes in institutional resource need and utilization over the first 2 years post-arrival (Aim 1), Cochran's Q test was conducted. Cochran's Q is an omnibus test recommended to examine change in dichotomous or categorical variables with a repeated measures design when more than two measurements are taken [18]. Follow-up post hoc comparisons were conducted using McNemar's test for repeated measures of dichotomous outcomes. To examine how pre-displacement trauma exposure and socio-demographic variables predicted cumulative institutional resource needs and cumulative resource utilization in the 2-year post-arrival period (Aim 2), multiple linear regression (MLR) was used. MLR was also used to examine whether PTSD and depressive symptoms 2 years post-arrival were associated with cumulative institutional resource needs or cumulative resource utilization (Aim 3). Aim 3 analyses controlled for known correlates of mental health (i.e., age, gender, education, marital status, living situation, transition time, pre-migration trauma exposure, and functional English language ability). To examine whether symptoms increased or decreased from baseline to the 2-year assessment, these analyses also controlled for baseline symptoms. Follow-up analyses for Aim 3 were conducted with MLR to examine which individual health care needs and utilization predicted 2-year interview PTSD and depression symptoms, controlling for the aforementioned health correlates and baseline symptoms. For all regression analyses, variables were entered simultaneously. All statistical analyses were conducted using IBM SPSS 22.0 with significance set to a 2-tailed p value $< .05$.

Results

Table 1 presents descriptive data at baseline. Note that the sample was relatively young ($M_{\text{age in years}} = 33.41$, SD 11.29) and had experienced a high number of potentially traumatic events prior to arrival ($M = 12.54$, SD 3.51).

Aim 1: need and utilization of institutional resources over time

As shown in Table 2, the need for 6 of the 14 institutional resources (i.e., Bridge Card for food benefits, cash assistance, transportation assistance, subsidized housing, English language training, and job placement), followed a pattern of stability from baseline to 1 year and then a significant decline from 1 to 2 years. For example, the need

Table 1 Baseline characteristics of Iraqi refugees in the sample ($N = 298$)

	<i>M</i> (SD)	<i>n</i> (%)
Age (years)	33.41 (11.29)	
Time in transition (months)	28.57 (27.82)	
Pre-displacement trauma ^a	12.54 (3.51)	
Gender		
Female		137 (46.0)
Male		161 (54.0)
Ethnicity		
Chaldean Christian		266 (89.3)
Arab		26 (8.7)
Kurdish		3 (1.0)
Armenian		3 (1.0)
Marital status		
Married		154 (51.7)
Not married/other		144 (48.3)
Current living situation		
Core family		201 (67.4)
Alone/non-family		97 (32.6)
Education		
Less than high school		213 (71.5)
High school or greater		85 (28.5)
Functional English ^b	2.72 (.99)	

^a Cumulative pre-displacement trauma measured using the Harvard Trauma Questionnaire. Range 0–39

^b Higher functional English ratings imply greater English language ability. Range 1–5

for transportation assistance was 89.2 % at baseline, 92.0 % at 1-year interview, and then declined significantly to 24.1 % at the 2-year interview. The need for job skills training was the only resource with constant decline across the measurement waves. The need for two institutional resources—Women Infants, and Children (WIC) benefits and help with immigration services—increased and then decreased over the 2 years. The need for child day care increased from baseline to 1-year and then stabilized. The need for four other institutional resources (i.e., translation assistance, medical care, dental care, and psychological services) demonstrated no significant change over time.

Table 2 also provides the trajectories of resource utilization over the three assessment waves. Utilization of 9 of the 14 institutional resources items demonstrated a parabolic trend, increasing from baseline to 1-year then decreasing substantially at the 2-year interview (e.g., Bridge Card for food benefits was 12.2, 99.6, and 59.4 %, respectively). Help with immigration services and translation assistance followed a steadily increasing trend over the 2 years. Use of child day care, WIC benefits, and psychological services all increased from baseline to 1 year and then stabilized between years 1 and 2.

Aim 2: pre-displacement and socio-demographic variables associated with resource needs and utilization

Table 3 presents the relationships of the pre-displacement and socio-demographic variables with cumulative institutional resource needs and utilization over the 2-year period. Of specific note is the positive association between pre-displacement trauma exposure and cumulative health care needs during the post-arrival period ($\beta = .17$, $p < .001$), although pre-displacement trauma was not related to the utilization of health care resources ($\beta = .06$, $p = .27$). Also of note is the negative association between functional English and five of the ten institutional resource needs and utilization categories. Transition time was not related to any of the resource needs or utilization categories.

Aim 3: the relationships of resource need and utilization to psychiatric symptoms after 2 years

Refugees reported a significant increase in PTSD symptoms between the 1 and 2-year interviews [$t(277) = -5.60$, $p < .001$], and a significant increase in depression symptoms between baseline and 1 year [$t(289) = -6.74$, $p < .001$] (refer to Table 2). Table 4 presents the result of the regression models predicting symptoms at the 2-year interview using cumulative resource need and utilization, controlling for baseline symptoms and other background variables. Cumulative cash/subsidized assistance needs predicted increased PTSD and depressive symptoms at the 2-year interview (Table 4). In addition, higher cumulative health care needs predicted increased PTSD ($\beta = .50$, $p < .001$) and depressive symptoms ($\beta = .32$, $p < .001$). Counter to our hypothesis, however, higher health care utilization also predicted increased PTSD ($\beta = .23$, $p < .001$) and depressive symptoms ($\beta = .18$, $p = .002$). Specifically, higher utilization of psychological services in the first 2 years predicted a significant increase in both PTSD symptoms [$\beta = .46$, $p < .001$; $R^2 = .43$, $F(10, 266) = 20.41$, $p < .001$] and depressive symptoms [$\beta = .35$, $p < .001$; $R^2 = .48$, $F(10, 261) = 24.34$, $p < .001$]. Neither the use of dental care nor medical care was associated with significant changes in PTSD or depressive symptoms.

Discussion

Among newly arrived Iraqi refugees to the US, changes over time were found in both the need for and utilization of institutional resources, with the lowest needs generally reported after 2 years, and the highest utilization tending to occur during the first year post-arrival. Refugees reporting

Table 2 Institutional resource needs and utilization and mental health during the first 2 years after arrival

Institutional resource needs	Baseline <i>n</i> (%)	1 year <i>n</i> (%)	2 years <i>n</i> (%)	<i>p</i> ^a
Immigration services				
Help with immigration services (<i>N</i> = 278)	240 (86.33) ^b	268 (96.40) ^c	259 (93.17) ^d	<.001
Translation assistance (<i>N</i> = 279)	244 (87.46) ^b	250 (89.61) ^b	257 (92.11) ^b	.13
Family care services				
Child day care (<i>N</i> = 278)	33 (11.87) ^b	78 (28.06) ^c	82 (29.50) ^{cd}	<.001
Women, infants, children (WIC) benefits (<i>N</i> = 278)	11 (39.57) ^b	73 (26.26) ^c	62 (22.30) ^d	<.001
Cash/subsidized assistance				
Bridge card for food benefits (<i>N</i> = 278)	275 (98.92) ^b	278 (100) ^b	234 (84.17) ^c	<.001
Cash assistance (<i>N</i> = 276)	275 (99.64) ^b	276 (100) ^b	196 (71.01) ^c	<.001
Transportation assistance (<i>N</i> = 278)	248 (89.21) ^b	258 (92.01) ^b	67 (24.10) ^c	<.001
Subsidized housing (<i>N</i> = 277)	262 (94.58) ^b	269 (97.11) ^b	120 (43.32) ^c	<.001
Job training				
English language training (<i>N</i> = 267)	248 (92.88) ^b	245 (91.76) ^b	232 (86.89) ^c	.005
Job skills training (<i>N</i> = 262)	201 (76.71) ^b	73 (27.86) ^c	14 (53.44) ^d	<.001
Job placement (<i>N</i> = 274)	245 (89.42) ^b	230 (83.94) ^b	83 (30.29) ^c	<.001
Health care				
Medical care (<i>N</i> = 277)	277 (100) ^b	277 (100) ^b	275 (99.28) ^b	.14
Dental care (<i>N</i> = 276)	275 (99.64) ^b	275 (99.64) ^b	273 (98.91) ^b	.57
Psychological services (<i>N</i> = 274)	30 (10.95) ^b	34 (12.41) ^b	43 (15.69) ^b	.07
Institutional resource utilization				
Immigration services				
Help with immigration services (<i>N</i> = 280)	3 (1.07) ^b	97 (36.64) ^c	215 (76.79) ^d	<.001
Translation assistance (<i>N</i> = 279)	1 (.35) ^b	77 (27.60) ^c	211 (75.63) ^d	<.001
Family care services				
Child day care (<i>N</i> = 278)	1 (.36) ^b	63 (22.66) ^c	73 (26.26) ^{cd}	<.001
Women, infants, children (WIC) benefits (<i>N</i> = 279)	1 (.35) ^b	61 (21.86) ^c	58 (20.79) ^{cd}	<.001
Cash/subsidized assistance				
Bridge card for food benefits (<i>N</i> = 278)	34 (12.23) ^b	277 (99.64) ^c	165 (59.35) ^d	.001
Cash assistance (<i>N</i> = 280)	35 (12.50) ^b	271 (96.78) ^c	75 (26.79) ^d	<.001
Transportation assistance (<i>N</i> = 278)	2 (.72) ^b	83 (29.86) ^c	3 (1.08) ^b	<.001
Subsidized housing (<i>N</i> = 277)	3 (1.08) ^b	148 (53.42) ^c	12 (4.33) ^d	<.001
Job training				
English language training (<i>N</i> = 279)	12 (4.30) ^b	152 (54.48) ^c	72 (25.81) ^d	<.001
Job skills training (<i>N</i> = 264)	1 (.38) ^b	27 (10.23) ^c	4 (.15) ^b	<.001
Job placement (<i>N</i> = 279)	9 (3.23) ^b	148 (53.05) ^c	35 (12.54) ^d	<.001
Health care				
Medical care (<i>N</i> = 280)	27 (96.42) ^b	259 (92.50) ^c	153 (54.64) ^d	<.001
Dental care (<i>N</i> = 280)	16 (5.71) ^b	187 (66.79) ^c	109 (38.93) ^d	<.001
Psychological services (<i>N</i> = 275)	2 (.72) ^b	23 (8.36) ^c	24 (8.72) ^c	<.001
Mental health variables	<i>M</i> (SD)	<i>M</i> (SD)	<i>M</i> (SD)	<i>p</i> ^e
PTSD symptoms ^f	19.34 (5.11) ^b	19.33 (5.24) ^b	20.79 (4.96) ^c	<.001
Depression symptoms ^g	1.80 (3.36) ^b	3.26 (4.16) ^c	3.20 (4.10) ^c	<.001

Frequencies and means with differing superscripts within rows are significantly different at the $p < .05$ based on McNemar post hoc paired comparisons (frequencies) or repeated measures *t* test (means)

^a Cochran's Q test

^{b, c, d} Differing superscripts indicate significant change over time

^e Repeated measures ANOVA

^f PTSD symptoms scored such that higher scores indicate greater PTSD symptoms. Theoretical range 17–85

^g Depressive symptoms scored such that higher scores indicate greater depression symptoms. Theoretical range 0–21

higher pre-displacement trauma exposure reported a higher need for medical care resources but not utilization of medical care. Refugees with higher cash/subsidized assistance needs and health care needs reported increased symptoms of depression and PTSD over the 2 years. Surprisingly, higher utilization of psychological services predicted an increase in these symptoms.

Changes over time in resource needs and utilization

For almost half of the resources we surveyed, refugees reported declining needs over the 2 years, suggesting that as refugees establish social and financial capital in the US, their need for institutional resources declines. Also of note are four institutional resource needs that did not change over time. Of these, the need for translation assistance, medical care, and dental care never dropped below 87 %. Upon arrival to the US, refugees currently are provided 8 months of subsidized health and dental insurance [19], yet Iraqi refugees frequently lacked access to medical care in Iraq and, thus, often have poor health upon entering the US [6]. As such, their health care and dental needs appear to require more than 8 months of coverage in the US.

Somewhat surprisingly, refugees' need for psychological services did not change across the three measurement waves. That only 11 % of refugees reported needing psychological assistance at baseline seems unexpectedly low, given the high trauma exposure of this group. However, this low need may highlight a larger issue in refugee research. Although it is commonly believed that trauma-exposed refugees are psychologically unhealthy, many studies have examined only refugees who are seeking or in treatment [e.g., 20] or who have been in the host country for years [e.g., 13], both of which would explain higher observed rates of psychological problems. However, we found low rates of both PTSD and depression symptoms as well as relatively low need for psychological services. Our data are consistent with observations that Iraqis living in Iraq had a 1.1 % prevalence of PTSD and 3.9 % prevalence of depression, despite being highly trauma-exposed [21]. Thus, our results add to the growing body of evidence suggesting that rates of PTSD and depression vary widely, and the majority of refugees are psychologically well [22, 23].

As hypothesized, refugees reported increasing resource utilization over time. Nine of the 14 resources had peak utilization 1 year after arrival followed by a notable decline. This pattern may be due to a diminished ability to access certain resources. For example, use of health care likely declined due to termination of insurance, which is a primary driver of utilization [24]. Why other resource utilization declined, however, is not known. For example, did subsidized housing utilization decline because the

refugees no longer needed help, or because they felt unsafe in the housing environments funded by resettlement agencies [3]?

The discrepancy between need for and use of psychological services is noteworthy. Across all measurement waves, more refugees reported needing psychological services than using them. These findings replicate previous research on Iraqi refugees in the Netherlands [4]. One possible explanation for this is the stigma associated with mental illness and treatment in Middle Eastern cultures [25, 26]. People from such cultures may preferentially underreport psychological problems or present with physical symptoms rather than be diagnosed with and treated for a mental disorder [27, 28]. Compounding this issue is that cultural stigma applies not only to individuals experiencing mental illness, but also to families [29]. Although these refugees may genuinely need mental health care, utilization of this care may seem daunting or impossible within their culture.

Pre-displacement and socio-demographic variables

The roles of pre-displacement and socio-demographic variables on needs and utilization were complex. Being older, for example, was associated with less need for and utilization of family care services, probably because older adults are less likely to need services such as subsidized child-care. However, being older was associated with increased utilization of cash/subsidized assistance and increased need for and utilization of health care. Similarly, many socio-demographic variables that were associated with less need in one resource category were associated with more need in another resource domain. These results highlight the nuanced nature of the refugee experience and how high institutional resource needs in one area may not represent high needs or utilization for all socio-demographic subgroups.

Previous, predominantly cross-sectional research [10, 11] has found that refugees with the highest rates of pre-displacement trauma exposure also reported the highest rates of mental disorders and chronic medical conditions, which should predict higher medical needs within the host country. Consistent with this, we found that high pre-displacement trauma exposure predicted higher needs for health care across the 2-year measurement period; however, exposure to pre-displacement trauma was unrelated to the use of health care resources. This difference in needs and utilization suggests highly trauma-exposed refugees report an increased need for health care resources, but for reasons such as language barriers [7], stigma, or not having a regular physician [30], these needs are not met.

Finally, we found that refugees with poorer functional English reported high health care needs but not utilization.

Table 3 Results of multiple linear regressions showing how pre-displacement trauma and socio-demographic factors predict cumulative institutional resource needs and utilization during the first 2 years after arrival ($N = 285$)

	Needs ^a		Utilization ^b	
	β^c	sr^{2d}	β	sr^2
Immigration services				
Age	-.06	.003	.003	<.001
Gender (reference = male)	-.03	<.001	-.04	.001
Education (reference = ≤ high school)	-.13*	.01	-.05	.001
Marital status (reference = married)	-.04	<.001	-.09	.005
Living situation (reference = family)	.02	<.001	-.06	.004
Transition time to US	.05	.003	.01	<.001
Pre-displacement trauma	.04	.002	.05	.003
Functional English ^e	-.26***	.04	-.09	.005
Family care services				
Age	-.43***	.12	-.43***	.12
Gender (reference = male)	-.01	<.001	-.02	<.001
Education (reference = ≤ high school)	.08	.005	.08	.005
Marital status (reference = married)	-.78***	.41	-.76***	.38
Living situation (reference = family)	.05	.003	.04	.002
Transition time to US	.05	.003	.04	.002
Pre-displacement trauma	.09	.006	.09	.006
Functional English	-.10	.006	-.11*	.008
Cash/subsidized assistance				
Age	.04	.001	.25***	.04
Gender (reference = male)	.14**	.02	.09	.006
Education (reference = ≤ high school)	-.002	<.001	-.08	.005
Marital status (reference = married)	-.13*	.01	-.18**	.02
Living situation (reference = family)	.001	<.001	.06	.004
Transition time to US	.09	.008	.08	.006
Pre-displacement trauma	-.003	<.001	.03	<.001
Functional English	-.41***	.11	-.14*	.01
Job training				
Age	-.16*	.02	.04	<.001
Gender (reference = male)	-.14*	.02	-.06	.003
Education (reference = ≤ high school)	-.08	.005	.04	.002
Marital status (reference = married)	-.09	.005	.03	<.001
Living situation (reference = family)	.13*	.02	.02	<.001
Transition time to US	.07	.004	.002	<.001
Pre-displacement trauma	.03	<.001	.02	<.001
Functional English	.06	.003	.08	.004
Health care				
Age	.28***	.05	.21***	.03
Gender (reference = male)	.06	.004	.18***	.03
Education (reference = ≤ high school)	-.02	<.001	-.06	.003
Marital status (reference = married)	.16*	.02	-.29***	.06
Living situation (reference = family)	.02	.006	-.05	.003
Transition time to US	.06	.004	.08	.006
Pre-displacement trauma	.17**	.03	.06	.004
Functional English	-.25***	.04	-.02	<.001

^a Across all needs categories, higher scores represent higher reported needs

^b Across all utilization categories, higher scores represent higher reported utilization

^c Standardized regression coefficients

^d Squared semi-partial correlation coefficient which represents the proportion of variance uniquely associated with the respective predictor variable

* $p < .05$, ** $p < .01$, *** $p < .001$

Table 4 Results of multiple linear regressions showing how cumulative institutional resource needs and utilization predict PTSD and depressive symptoms at 2-year measurement when controlling for baseline mental health ($N = 272$)

	PTSD symptoms				Depressive symptoms			
	Needs ^a		Utilization		Needs ^a		Utilization ^b	
	β^c	sr^{2d}	β	sr^2	β	sr^2	β	sr^2
Immigration services	.05	.003	.10	.008	.06	.003	.004	<.001
Family care services	.07	.003	.03	<.001	.03	<.001	.01	<.001
Cash/subsidized assistance	.13*	.01	.05	.001	.30***	.06	.03	<.001
Job training	-.08	.005	-.05	.003	-.04	.002	-.05	.003
Health care	.50***	.18	.23***	.04	.32***	.07	.18**	.02

All analyses control for baseline mental health (i.e., either PTSD or depression), age, gender, education, marital status, living situation, transition time to US, pre-displacement trauma exposure, and functional English language ability

^a Across all needs categories, higher scores represent higher reported cumulative needs across the three measurement waves

^b Across all utilization categories, higher scores represent higher reported cumulative utilization across the three measurement waves

^c Standardized regression coefficients

^d Squared semi-partial correlation coefficient which represents the proportion of variance uniquely associated with the respective predictor variable

* $p < .05$, ** $p < .01$, *** $p < .001$

Indeed, it appears that poorer functional English permeates many aspects of these Iraqi refugees' lives, including the need for immigration services, cash/subsidized assistance, and health care. A potentially promising observation is that low functional English predicted increased use of family care services and cash/subsidized assistance, indicating that that refugees who may be especially at risk (e.g., a female refugee with poor functional English and several young children) are utilizing at least some of the services designed to help them during this early post-displacement period (e.g., women, infant, and children benefits).

The role of institutional resources in mental health

High cumulative cash/subsidized assistance needs predicted increased reporting of PTSD and depression symptoms over 2 years, which is consistent with the finding that Bosnian refugees with low socioeconomic status in the host country had more depressive symptoms [31]. In the current sample, however, the utilization of cash/subsidized assistance did not predict a decrease in symptoms. These findings point toward the careful allocation of resources when considering refugee mental health. Although high cash needs are associated with more symptoms, it is not clear that simply increasing use of cash/subsidized assistance would significantly improve mental health.

Prior cross-sectional research found that needing health care resources is associated with poor mental health in refugees [4]. Our longitudinal study supported this, showing that refugees with the greatest health care needs

reported an increase in PTSD and depressive symptoms over 2 years. This is the first longitudinal study demonstrating that high resource needs in some domains are associated not only with mental health problems but increasing symptoms.

Interestingly, we did not find support for the hypothesis that increased use of institutional resources reduces psychiatric symptoms. In fact, increased need for and use of psychological services predicted an increased report of PTSD and depressive symptoms over time. These results seem surprising given the assumption that access to and utilization of institutional resources should improve mental health [5, 7, 32]. Our finding may reflect the possibility that refugees who have declining mental health are more likely to seek psychological help. A second explanation stems from the observation that our sample reported very low levels of PTSD and depression symptoms, perhaps due to culturally imposed suppression or non-reporting. It is possible that obtaining psychological services actually reverses this suppression, helping patients disclose their symptoms more readily. Indeed, becoming able to acknowledge one's struggles may be a sign of openness and a gateway to improved mental health.

Strengths, limitations, and implications

Notable strengths of this study are our ability to examine a randomly selected sample of newly arrived refugees and follow their trajectories over the first 2 years with very high retention (96 %). The inclusion of both institutional resource needs and utilization over time is also of value,

because the two are not redundant. This study has several limitations, however. Although it was longitudinal and followed refugees from their arrival in the US, a longer follow-up period would be desirable. Additionally, all data were self-reported, we did not externally validate our measure of needs and utilization, and responses were dichotomous, preventing us from examining variations in the quantity of each resource need or utilization. Finally, we examined only newly arrived Iraqi refugees to the US; thus, results do not apply to all refugees.

Refugees arrive in the host country with few social and financial resources and often with risk factors for poor mental and physical health (e.g., exposure to pre-displacement trauma); however, many refugees adapt well. Our data suggest that although Iraqi refugees report many resource needs, they also increasingly use resources as they learn to navigate within the host country. Funding agencies should consider these needs and potential utilization when designing refugee assistance programs. Intervention and aid programs are costly, and creating programs that may be needed but under-utilized is inefficient. For example, refugees may need psychological services upon arrival to the host country but unless these services are tailored to the specific cultural group, utilization and subsequent effectiveness of such services may be low. By adapting programs to meet the needs and utilization of refugee groups, government and community agencies can properly allocate scarce funding and at the same time optimize health outcomes.

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