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Physical and mental health of Afghan, Iranian and Somali asylum seekers and refugees living in the Netherlands

ABSTRACT

Context Worldwide, the number of refugees and asylum seekers is estimated to be about 11.5 million plus a much larger number of former refugees who have obtained a residence permit in a new country. Although asylum seekers have been coming to the Netherlands since the 1980s, very few epidemiological studies have focused on this group of inhabitants or on the refugees who have resettled in this country. **Objectives** The objectives of this study were to estimate the prevalence rates of physical and mental health problems and to identify the risk factors for these complaints. **Design, Setting, and Participants** A population-based study was conducted in the Netherlands from June 2003 to April 2004 among adult refugees and asylum seekers from Afghanistan, Iran and Somalia. Asylum seekers were living in 14 randomly selected reception centres, and random samples of refugees were obtained from the population registers of three municipalities (Arnhem, Leiden and Zaanstad). A total of 178 refugees and 232 asylum seekers participated (response rates of 59 and 89%, respectively). **Main Outcome Measures** General health and physical health were measured with the Short Form-36 and a list of 19 chronic conditions, respectively; symptoms of post-traumatic stress disorder (PTSD), depression and anxiety, were measured with the Harvard Trauma Questionnaire and the Hopkins Symptoms Checklist-25. **Results** More asylum seekers (59.1%) than refugees (42.0%) considered their health to be poor ($P=0.001$). In both groups, approximately half of the respondents suffered from more than one chronic condition.

More asylum seekers than refugees had symptoms of PTSD (28.1 and 10.6% respectively; $P=0.000$) and depression/anxiety (68.1 and 39.4, respectively; $P=0.000$). Respondents from Afghanistan and, in particular, from Iran had a higher risk for PTSD and depression/anxiety. Female gender was associated with chronic conditions, PTSD and depression/ anxiety, and higher age was associated with poor general health and chronic conditions. A greater number of traumatic events were associated with all health outcomes, and more post-migration stress and less social support was associated with PTSD and depression/ anxiety symptoms. **Conclusions** Both physical and mental health problems are highly prevalent among refugees and asylum seekers in the Netherlands. Although higher prevalence rates for most health outcomes were found among asylum seekers, both the specific health services for asylum seekers and the general health services in the municipalities should be aware of these problems.

INTRODUCTION

Worldwide, the number of refugees and asylum seekers is estimated to be about 11.5 million [1] plus a much larger number of former refugees who have obtained a residence permit in a new country. A recent systematic review concluded that, worldwide, tens of thousands of (former) refugees who resettled in Western countries probably have post-traumatic stress disorder (PTSD) [2]. Although asylum seekers have been coming to the Netherlands since the 1980s, very few epidemiological studies have focused on this group of inhabitants or on the refugees who have resettled in this country [3–6]. Many population-based studies on adult refugees and asylum seekers living in Western countries report on the prevalence of mental health problems, which mainly concern symptoms of PTSD, depression and anxiety [7], but only a few have investigated general health status and/or physical complaints [5, 6, 8–12]. Most studies were based on relatively small sample sizes and included people from one country of origin only. Furthermore, the majority of studies focused either on refugees or on asylum seekers. However, in European countries, a differentiation can be made between refugees who have obtained a residence permit, because they have been recognized as being in genuine fear of persecution, and asylum seekers who are still in the process of achieving such status (and of whom the majority will never be recognized as a refugee). It would be interesting to compare the two groups because they differ in many aspects. The residence permit gives refugees the opportunity to resettle in the Netherlands. Furthermore, they have already been living in the country for several years and may have found a job and built up a social network. In contrast, asylum seekers are uncertain about obtaining a residence permit, and therefore, their whole future is uncertain. They have just arrived in the Netherlands, have a recent history of traumatic experiences, are living in reception centres and are not allowed to work. A large scale population-based study on adult refugees and asylum seekers from Afghanistan, Iran and Somalia was therefore conducted in the Netherlands to estimate the prevalence rates of physical and mental health problems and to identify the risk factors for these complaints.

METHODS

An extensive description of the methods, including the selection of the study population and ethnic groups, the chosen outcome measures, the translation and cross-cultural adaptation of the measurement instruments, the training of the interviewers and the practical execution of the study, can be found elsewhere [7].

Study population

Asylum seekers were approached in 14 randomly selected reception centres in the Netherlands. Random samples of refugees were obtained from the population registers of three municipalities (Arnhem, Leiden and Zaanstad), including adults born in Afghanistan, Iran or Somalia (or if the country of birth was not recorded, at least one parent born in one of these countries). In the groups, a random selection was made of one person per family/address for inclusion in the study. All random samples were obtained by assigning numbers to individuals and then using the random number

generator of the Statistical Package for the Social Sciences (SPSS) to select the required sample. The plan was to include 100 refugees and 100 asylum seekers per country of origin to make it possible to compare prevalence rates within subgroups. Those who were selected for inclusion in the study were first sent a letter, after which they were contacted by one of 33 specifically trained bilingual interviewers from the three countries of origin. Informed consent was obtained verbally from all respondents, and the study protocol was approved by the Medical Ethics Committee of the VU University Medical Centre in Amsterdam.

Health outcomes

The current health status of the respondents was measured according to the general health question of the Medical Outcomes Study (MOS) 36-item Short-Form Health Survey (SF-36) [13]. Physical health was measured according to a list of 19 chronic conditions, and the respondents were asked to indicate whether they had had this condition in the previous 12 months. Nine conditions from the screening list used by the Community Health Services for Asylum Seekers were added to the original list. The Harvard Trauma Questionnaire (HTQ) was used to measure symptoms of PTSD [14]. It includes 30 symptoms, the first 16 of which were derived from the *Diagnostic and Statistical Manual of Mental Disorders, 4th edition (DSM-IV)* criteria for PTSD, and the other 14 describe symptoms related to the traumatic life events of Indochinese refugees. The respondents were asked to indicate the extent to which they were bothered by each symptom in the previous week, ranging from 1 = not at all to 4 = extremely. The Hopkins Symptoms Checklist-25 (HSCL-25) was used to measure symptoms of depression (15 items) and anxiety (10 items) [15]. The format of the response options is comparable with that of the HTQ. Because an earlier study on symptoms of depressive illness concluded that the majority of Afghan patients will express death wishes rather than suicidal thoughts, this item was added to the depression scale [16]. Two items describing typical symptoms of distress related to depression in the Iranian culture were also added to the Farsi version of the questionnaire: *nârâhati-e qalb* (distress of the heart) and *nârâhati-e a'sâb* (distress of the nerves) [17]. An attempt was made to identify culture-specific symptoms of PTSD, depression and anxiety by giving respondents the opportunity to mention symptoms that were not included in the list. Both the HTQ and the HSCL-25 provide outcomes at symptom level and not at diagnosis level.

Potential risk factors

The following socio-demographic variables were recorded: residence permit (yes/no), country of origin, gender, age, marital status and whereabouts of spouse, highest level of education completed and period of residence in the Netherlands. Traumatic experiences were assessed with the HTQ, which includes 17 events. To identify traumatic events that are particularly relevant to people from Afghanistan, Iran and Somalia, 15 events were added to the list. The respondents were also asked about any possible stressful experiences that they had encountered in the Netherlands. The checklist included 18 problems, and the respondents were asked to indicate the extent to which any of these problems had bothered them in the previous month (1 = not at all to 4 = extremely). The perceived amount of social support received was measured based on six statements (e.g.

“If I have problems there are people I can turn to”), and the respondents were asked to indicate whether these statements applied to them (yes/no) in the previous month. To estimate the level of acculturation, the respondents were asked if they were feeling at home in the Netherlands. Response items were ‘very much/reasonably’ and ‘a little/not at all’.

Following published guidelines, all questionnaires were crossculturally adapted, translated into Dari, Pashto, Farsi and Somali, back-translated and pretested [18, 19].

Statistical analysis

Two-tailed Pearson chi-square and Student's *t* tests were used to examine the differences in socio-demographic variables and other potential risk factors between refugees and asylum seekers. Differences in health outcomes between the two groups were examined by calculating the odds ratios (ORs), 95% confidence intervals and *P* values in univariate logistic regression analyses.

To identify the factors that were independently associated with the health outcomes, multivariate logistic regression analyses were performed by entering all variables simultaneously. Adjusted ORs were calculated to control for the presence of all other variables in the model.

For the univariate and multivariate logistic regression analyses, the response options of all variables were dichotomised:

1. For the SF-36, responses were dichotomised into good (excellent, very good, good) and poor (fair, poor).
2. For the list of chronic conditions, a sum score was calculated based only on the 19 items from the original list, to make the results comparable with data from a health survey among the general and immigrant population of the Netherlands [20]. This sum score (range 0–19) was dichotomised into '0 or 1' vs 'more than 1' chronic condition.
3. For the HTQ (PTSD), individuals with a mean score of ≥ 2.5 on the 16 PTSD symptoms were considered to be symptomatic.
4. For the HSCL-25, individuals with a mean score of > 1.75 for depression and/or anxiety and/or the total list of symptoms were considered to be symptomatic.
5. For the HTQ (traumatic experiences), the total number of events experienced was calculated (range 0–17), and for the logistic regression analyses, three groups, which were approximately equal in size, were formed: respondents experiencing 0 to 3, 4 to 7, and more than 8 traumatic events;
6. For the list with stressful experiences in the Netherlands, a mean score was calculated (range 1–4), which was dichotomised into < 2.5 and ≥ 2.5 (low and high levels of post-migration stress, respectively).
7. For the list with social support statements, a sum score was calculated based on the number of positive items (range 0–6), and for the logistic regression analyses, this was dichotomised into > 3 and ≤ 3 (high and low levels of social support, respectively).

$P < 0.05$ was considered to be statistically significant for all analyses, which were performed with SPSS (version 10.1.4).

RESULTS

Characteristics of the study population

For 10 months (June 2003 to April 2004), a total of 479 refugees were approached in various municipalities. Thirty-four refugees did not fulfil the inclusion criteria (24 were younger than 18 years old), and 144 could not be reached [60% were never at home, 34% were not living (anymore) at the given address]. Of the remaining 301 refugees, 123 were not interviewed mainly because they were too busy or were not interested in participating. This resulted in a response rate of 59% (178/301) for the total groups of refugees and of 70% for the Afghan, 53% for the Iranian and 46% for the Somali refugees. Of the 178 respondents, 94% had obtained a residence permit or the Dutch nationality. In the reception centres, 391 asylum seekers were approached, 128 of whom could not be reached (66% were no longer living in the centre, 34% were never at home), and one was younger than 18 years old. Of the remaining 262 asylum seekers, only 30 were unwilling to be interviewed, which resulted in a response rate of 89% (232/262). Of the 232 respondents, 90% did not (yet) have a residence permit. The number of respondents per country of origin is presented in Table 1. The respondents and those who could not be reached did not differ in age or gender (both asylum seekers and refugees). Furthermore, respondents and non-respondents (those reached but not interviewed) did not differ in age (both asylum seekers and refugees) and gender (only asylum seekers); in the municipalities (i.e. refugees), men were more likely to be unwilling to participate.

[TABLE 1]

Table 1 also compares the characteristics of the refugees and the asylum seekers. There were more men than women in both groups. The refugees were somewhat older (except for the Somali refugees, who were the same age as the asylum seekers) and had resided in the Netherlands for a longer period. There were differences between the subgroups: the Iranian refugees had been in the Netherlands for the longest period (mean 12.0 years, SD 4.2), and the Afghan asylum seekers for the shortest period (mean 2.8 years, SD 1.2). In both groups, the majority was married or living together with a partner (13% of the entire study population was married, with a spouse living abroad), but the asylum seekers had more often never been married and the refugees had more often been divorced. More than a third

of the asylum seekers had completed only primary school or less, whereas half of the refugees had completed higher education. Asylum seekers had experienced more traumatic events and post-migration stress, and Somali and Afghan asylum seekers had experienced the most traumatic events: 7.6 (SD 3.9) and 7.1 (SD 3.5), respectively, out of 17 events. The most frequently experienced traumatic events included 'forced separation from family members' (66.3%) and 'unnatural death of family or friend' (62.3%). Of the items added to the original list, 'flight to another part of the country' (75.3%), 'rocket attacks and bombardments' (74.6%) and 'hiding for a long time' (62.3%) were the most common experiences. For the asylum seekers, the items on the post-migratory stressors list with the highest score (1–4) were 'dissatisfaction with the delays in the application for a residence permit' (mean 3.5, SD 0.9) and 'uncertainty about obtaining a residence permit' (mean 3.2, SD 1.1), and for the refugees, 'homesickness' (mean 2.6, SD 1.1) and 'worry about family members left behind' (mean 2.3, SD 1.2). Among all respondents, nearly 20% scored 2.5 or more on the list, indicating high levels of post-migration stress. Asylum seekers reported that they experienced less social support compared with the refugees, and nearly half of the asylum seekers did not feel at home in the Netherlands, compared with only a quarter of the refugees. Among the respondents, 30.4% had a score of 3 or less on the list, classifying them as receiving low levels of social support.

Health outcomes

In Table 2, the health outcomes of the refugees and the asylum seekers are compared. More asylum seekers than refugees reported a poor general health status, and even 75.9% of the Iranian asylum seekers considered their health to be poor. In contrast, 64.8% of the Afghan refugees considered their health to be good. In both groups, approximately half of the respondents suffered from more than one chronic condition. The score was not dichotomised into '0' vs '1 or more' because more than two thirds of all respondents had at least one chronic condition. The mean number of chronic conditions (out of the original list of 19 conditions) was 2.0 (SD 2.3) for the entire study population. The most frequently reported chronic conditions were severe neck/shoulder problems (33.4%), severe/ chronic back complaints (32.7%) and migraine/severe headaches (32.6%). Of the items added to the original list, 'dental problems' (44.9%) and 'eye problems' (33.1%) were the most common. More asylum seekers than refugees had symptoms of PTSD. The highest rate was found in Iranian asylum seekers (43.4%), and the lowest rate, in Afghan and Somali refugees (6.0 and 4.0%, respectively). Since the other 14 symptoms of the HTQ were less specific for the present study population, they were not included in the mean score, although taking these symptoms into account made little change in the results. Depression and anxiety symptoms were more frequently reported among asylum seekers (total scale). Again, the lowest rates were found in Afghan and Somali refugees (28.9 and 16.7%, respectively). Because the results of the logistic regression analyses were very similar for the depression and anxiety subscales and the total scale, only the latter is presented in this table (and in Table 3). With regard to the subscales, 29.3% of the refugees and 61.5% of the asylum seekers reported symptoms on the depression scale, and 27.7 and 41.2%, respectively, on the anxiety scale. On the depression scale, the item 'suicidal thoughts' does not have to be replaced by 'death wishes' because the Afghan respondents scored similarly on both items. However, the item 'distress of the nerves' might be added to the Farsi version of the depression scale because the mean score on this item was high for the Iranian respondents. No other culture-specific symptoms of PTSD, depression or anxiety were identified.

[TABLE 2]

Factors associated with health outcomes

Table 3 shows the ORs for the associations between the characteristics of the study population and the health outcomes, adjusted for all other variables listed. As marital status and education were not risk factors for any of the health outcomes, the results of these variables are not presented. In this analysis, the association between legal status (refugee vs asylum seeker) and PTSD symptoms reached just statistical insignificance (when using $P < 0.05$). The associations between legal status and poor general health and between legal status and depression/anxiety symptoms remained. Respondents from Afghanistan and, in particular, from Iran had a higher risk of having more than one chronic condition (only Iran), PTSD and depression/anxiety symptoms than did respondents from Somalia. Respondents

from Iran had a higher risk of poor general health status, PTSD and depression/anxiety symptoms than did respondents from Afghanistan. Female gender was associated with chronic conditions, PTSD and depression/anxiety, whereas higher age was associated with poor general health and chronic conditions. A greater number of experienced traumatic events was associated with all health outcomes, although for general health status and chronic conditions, this was only true for the group who experienced eight or more events. More post-migration stress and less social support were both associated with PTSD and depression/ anxiety symptoms. Not feeling at home in the Netherlands was a risk factor for poor general health only.

[TABLE 3]

DISCUSSION

This study showed that more asylum seekers than refugees considered their health to be poor and had symptoms of PTSD and depression/anxiety. Respondents from Afghanistan and, in particular, from Iran had a higher risk of PTSD and depression/anxiety symptoms. Female gender was associated with chronic conditions, PTSD and depression/anxiety, and higher age was associated with poor general health and chronic conditions. A greater number of traumatic events was associated with all health outcomes, and more post-migration stress and less social support were associated with PTSD and depression/anxiety symptoms. Because the study design is cross-sectional, nothing can be said about the direction of causality of some of the associations found; for example, do the stressful experiences in the previous months lead to symptoms of depression/ anxiety in the previous week, or is this the other way around?

The described sampling procedures were intended to produce a representative sample of all refugees and asylum seekers from the three countries under study. Unfortunately, approximately one third of those who were approached could not be reached due either to incorrect address lists or absence from home during the day and the evening on three occasions. However, this is not expected to have caused any systematic bias; by trying to contact respondents three times during the day and the evening, attempts were made to reach also the most (socially) active (and healthy) refugees and asylum seekers. It is not clear to what extent unwillingness to participate may have biased the findings; for example, people with severe health problems could have volunteered to participate, but they may also have been unwilling to participate because they were afraid to be interviewed. Unfortunately, problems with response rate are common in studies on asylum seekers and refugees in the Netherlands [5, 6, 21].

A recently conducted systematic review described the cross-cultural validity and reliability of instruments measuring refugee trauma and health status [22]. The present study included some of the instruments that had either been developed for or adapted and tested in refugee research (HTQ and HSCL-25). However, the validity and reliability of these measurement instruments have not been tested (yet) in the population included in the present study, and no cutoff scores for symptomatic status have been established. Ideally, this study should have included a validation substudy to ascertain the most appropriate cut-off scores for this given population, as suggested by various researchers [22–24]. Nevertheless, the HTQ and the HSCL-25 have been used in several studies on refugees, where the described cut-off scores were also applied. For the HTQ, a scoring algorithm proposed by the Harvard Refugee Trauma Group based on *DSM-IV* criteria was also used to define respondents with PTSD symptoms, resulting in approximately the same number of cases (77 for the entire study population) as with the cut-off point of 2.5 [25]. Furthermore, all measurement instruments have gone through an extensive translation and cross-cultural adaptation process and have been pre-tested.

In the present study, high ORs for PTSD and depression/ anxiety symptoms were found in the Iranian group compared with the Somali and Afghan groups. The question is: are the prevalence rates among Iranians really much higher, or is there another explanation for these results, e.g. cultural difference in expressing mental health complaints and measurement instruments that are less valid for this population. The latter does not seem likely because differences in prevalence rates were also found for other health outcomes and indicators for the use of health care services (results described elsewhere).

Even after adjusting for other variables, the asylum seekers were found to have higher prevalence rates than did refugees for poor general health, PTSD and depression/anxiety symptoms. It is not expected that many asylum seekers exaggerated their problems because they were informed that

participation in the study would neither help nor hinder their request for asylum. Bearing that in mind, the higher response rate among asylum seekers will probably be mainly due to the fact that they have more time to participate compared with the refugees.

Few studies have addressed the longitudinal course of health problems in refugees and asylum seekers [26– 31]. In the present study, one might consider the results of the refugee group as a 5.5-year follow-up measurement of the group of asylum seekers. The period of residence in the Netherlands is highly correlated with legal status (if 5 years is taken as cut-off point, 87% of the respondents will be correctly classified as asylum seeker or refugee) and is therefore not included in the logistic regression analyses. In these analyses, if legal status is replaced by period of residence in the Netherlands, the ORs for both variables are almost equal. This supports the fact that the study might give an impression of the longitudinal course of health problems (decline in PTSD and depression/ anxiety symptoms and improvement in general health status), including the influence of aspects such as (un) certainty about residing in the Netherlands, living conditions, acculturation, care as usual, etc. However, one could also argue that the group of asylum seekers differs from the group of refugees because they left their country of origin in a different time and under different circumstances (which may explain the difference in the level of education and experienced traumatic events between both groups), and they arrived in the Netherlands in a different political climate (less tolerance towards asylum seekers, and more people are threatened to be sent back to their country of origin). The group of refugees is a sample from the original group of asylum seekers because refugees have been recognized as being in genuine fear of persecution, while the majority of asylum seekers will never be recognized as a refugee (and therefore, the likelihood is that, on average, the refugee sample possibly have more reliable traumatic experiences). As mentioned before, the difference in the number of experienced traumatic events between refugees and asylum seekers might be due to the different situation in the country of origin before they migrated. Another explanation might be that refugees may have forgotten certain events (or suppressed their memories so they can move on with their lives). Current research on the consistency of the memory of asylum seekers and refugees, or of others exposed to traumatic events, find that discrepancies in accounts are likely to occur as time proceeds [32], although reporting about exposure to traumatic events seems to be relatively consistent when the information is obtained in a well-structured manner (like with the HTQ) [33]. Furthermore, it is not totally clear whether these discrepancies lead to an increasing or decreasing number of reported events.

For PTSD, depression and anxiety symptoms, there is a huge range of prevalences reported in population-based studies focusing on adult refugees living in Western countries. The prevalence rates for PTSD symptoms range from 4 to 70%, and similar percentages are reported for the prevalence of symptoms of depression (3 to 88%) and anxiety (2 to 80%) [7]. This is due to the fact that the studies are very heterogeneous with regard to the study population (e.g. selection of the study population, country of origin, duration of residence in the country of resettlement and refugee status) and measurement instruments, which makes the comparison of the results of this study with other studies difficult. Only a few studies focusing on the same study population and/or using similar instruments for measuring mental health complaints are found. In a study among 54 Somalian asylum seekers (and refugees) living in reception centres in the Netherlands (65% less than 6 months), prevalence rates of 31.5% were found for PTSD, 63% for depression and 36% for anxiety symptoms, according to the HTQ and the HSCL-25 [6]. In the present study, similar rates for depression (60.0%) and anxiety (28.6%), but a somewhat lower rate for PTSD (19.3%), in Somali asylum seekers were found. A study conducted in the United Kingdom among 180 Somali refugees (and asylum seekers), who had been living there for an average of 8 years, reported a rate of 25% for depression and/or anxiety symptoms on the HSCL- 25, compared with 16.7% among the Somali refugees in the present study [34]. In a study among 51 Afghan refugees living for an average of 4 years in the Netherlands, the following prevalence rates were found based on the Composite International Diagnostic Interview: 35% with a diagnosis of PTSD, 57% with a diagnosis of depression and 12% with a diagnosis of anxiety [3]. Similar rates were found in the present study for PTSD (25.4%) and depression (54.7%), but a much higher rate was found for anxiety (39.3%) among Afghan asylum seekers. In a survey conducted in Afghanistan among 1,011 respondents, prevalences of 20.4% were found for PTSD, 38.5% for depression and 51.8% for anxiety, according to the HTQ and HSCL-25 [35]. For the entire group of Afghan respondents in the present study, similar rates were found for PTSD (17.3%) and depression

(36.6%), but a much lower rate for anxiety (32.3%). A survey conducted in Iran among 35,014 respondents found prevalences of 21% for depression and 20.8% for anxiety symptoms using the General Health Questionnaire [36]. We found much higher prevalences among the Iranian asylum seekers (77.6% for depression and 58.5% for anxiety) and refugees (58.9% for depression and 41.9% for anxiety). However, this might be expected, as our study population is composed of a selection of people from the general adult population of Iran with a history of loss and traumatic experiences.

Data on general health status and chronic conditions are only available from a health survey among the Dutch general and immigrant population [20]. In the general population, 18% considered their health to be poor, compared with 39% in the immigrant population, which is comparable with the refugee group. In the general population, 30% suffered from more than one chronic condition, and the mean number of chronic conditions was 1.5 (SD 2.0) for the immigrant population. Both of these figures are lower than the results for the entire study population.

Many factors related to the mental health of refugees and asylum seekers are reported in the literature, and the majority of studies report a positive association with the number of traumatic events experienced and the level of post-migration stress [24, 29, 34, 37–43]. However, there is conflicting evidence with regard to associations with gender, age, marital status and education [4, 24, 28, 29, 34, 37, 40, 43, 44].

CONCLUSION

Physical as well as mental health problems are highly prevalent among refugees and asylum seekers in the Netherlands. Although among asylum seekers, the prevalence rates are higher for most health outcomes, not only the Community Health Services for Asylum Seekers but also the general health services in the municipalities should be aware of these problems and be able to offer the necessary prevention and treatment facilities. There also seem to be differences between the prevalence rates of people from different countries of origin, and this is a result that could be useful for health care providers and preventive public health activities.

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TABLES

Table 1 Characteristics of the study population

Characteristic	Number (%) of respondents ^a			Statistic	P value
	Total (N=410)	Refugees (n=178)	Asylum seekers (n=232)		
Country of origin					
Somalia	87 (21.2)	25 (14.0)	62 (26.7)	NA	NA
Afghanistan	206 (50.2)	90 (50.6)	116 (50.0)		
Iran	117 (28.5)	63 (35.4)	54 (23.3)		
Gender					
Male	241 (58.8)	99 (55.6)	142 (61.2)	$\chi^2=1.30$	0.254
Female	169 (41.2)	79 (44.4)	90 (38.8)		
Mean age (SD) [years]	37.0 (12.4)	40.3 (13.3)	34.4 (11.1)	$t=4.83$	0.000
Marital status					
Divorced	40 (9.8)	25 (14.0)	15 (6.5)	$\chi^2=8.20$	0.042
Never married	100 (24.4)	36 (20.2)	64 (27.7)		
Married or living together	252 (61.6)	110 (61.8)	142 (61.5)		
Widowed	17 (4.2) (N=409)	7 (3.9)	10 (4.3) (n=231)		
Education					
Vocational/university	159 (38.8)	92 (51.7)	67 (28.9)	$\chi^2=29.13$	0.000
Secondary	142 (34.6)	59 (33.1)	83 (35.8)		
None/religious/primary	109 (26.6)	27 (15.2)	82 (35.3)		
Mean time in the Netherlands (SD) [years]	5.6 (4.0)	8.8 (4.1)	3.4 (1.6)	$t=16.98$	0.000
Mean number of traumatic events (SD) (0–17)	6.1 (3.7) (N=384)	5.3 (3.6) (n=172)	6.8 (3.7) (n=212)	$t=-4.19$	0.000
Mean score for post-migration stressors (SD) (1–4)	2.0 (0.6) (N=381)	1.6 (0.4) (n=162)	2.3 (0.5) (n=119)	$t=-5.60$	0.000
Mean sum score for social support (SD) (0–6)	4.1 (1.9) (N=404)	4.8 (1.5) (n=177)	3.6 (2.0) (n=227)	$t=6.78$	0.000
Feeling at home in the Netherlands					
Very much/reasonably	249 (60.9)	130 (73.0)	119 (51.5)	$\chi^2=19.55$	0.000
A little/not at all	160 (39.1) (N=409)	48 (27.0)	112 (48.5) (n=231)		

NA Not applicable

^aTotal number of respondents equals total number per group, unless indicated otherwise

Table 2 Health outcomes

Health outcome	Number (%) of respondents ^a			Unadjusted OR (95% CI)	P value
	Total (N=410)	Refugees (n=178)	Asylum seekers (n=232)		
Poor general health status	211 (51.7) (N=408)	74 (42.0) (n=176)	137 (59.1)	2.00 (1.34–2.96)	0.001
More than one chronic condition	183 (47.5) (N=385)	79 (46.5) (n=170)	104 (48.4) (n=115)	1.08 (0.72–1.62)	0.711
PTSD symptoms	81 (20.6) (N=394)	18 (10.6) (n=170)	63 (28.1) (n=124)	3.30 (1.87–5.84)	0.000
Depression/anxiety symptoms	210 (55.6) (N=378)	65 (39.4) (n=165)	145 (68.1) (n=213)	3.28 (2.15–5.02)	0.000

OR Odds ratio, CI confidence interval, PTSD post-traumatic stress disorder

^aTotal number of respondents equals total number per group, unless indicated otherwise

Table 3 Factors associated with health outcomes

Characteristic	Poor general health status		More than one chronic condition		PTSD symptoms		Depression/anxiety symptoms	
	Adjusted OR (95% CI)	P value	Adjusted OR (95% CI)	P value	Adjusted OR (95% CI)	P value	Adjusted OR (95% CI)	P value
Legal status								
Refugees	1.00		1.00		1.00		1.00	
Asylum seekers	1.85 (1.06–3.25)	0.031	1.25 (0.70–2.22)	0.453	2.49 (0.99–6.26)	0.052	2.63 (1.41–4.93)	0.002
Country of origin								
Somalia	1.00		1.00		1.00		1.00	
Afghanistan	0.79 (0.40–1.56)	0.497	1.81 (0.87–3.77)	0.115	3.08 (1.05–9.07)	0.041	2.89 (1.22–6.80)	0.015
Iran	1.66 (0.78–3.54)	0.188	2.55 (1.13–5.74)	0.024	18.46 (5.19–65.64)	0.000	11.11 (4.01–30.80)	0.000
Gender								
Male	1.00		1.00		1.00		1.00	
Female	1.29 (0.76–2.18)	0.340	3.02 (1.72–5.29)	0.000	3.45 (1.53–7.78)	0.003	2.42 (1.30–4.52)	0.005
Age (years)								
18–27	1.00		1.00		1.00		1.00	
28–37	1.53 (0.77–3.06)	0.223	2.14 (1.03–4.42)	0.041	1.45 (0.51–4.14)	0.493	1.02 (0.45–2.32)	0.966
38–47	3.79 (1.72–8.34)	0.001	3.03 (1.34–6.85)	0.008	2.58 (0.76–8.71)	0.127	1.04 (0.43–2.54)	0.928
≥48	3.50 (1.48–8.26)	0.004	8.47 (3.35–21.40)	0.000	1.54 (0.44–5.48)	0.501	1.71 (0.65–4.48)	0.273
Number of traumatic events (0–17)								
0–3	1.00		1.00		1.00		1.00	
4–7	1.59 (0.85–2.96)	0.145	1.65 (0.86–3.18)	0.133	4.82 (1.44–16.11)	0.011	4.05 (1.94–8.45)	0.000
≥8	2.51 (1.32–4.75)	0.005	3.44 (1.72–6.89)	0.000	12.18 (3.59–41.34)	0.000	6.38 (2.97–13.74)	0.000
Mean score for post-migration stressors (1–4)								
<2.5	1.00		1.00		1.00		1.00	
≥2.5	1.90 (0.92–3.93)	0.085	1.45 (0.71–2.93)	0.306	4.31 (1.93–9.61)	0.000	4.48 (1.60–12.56)	0.004
Sum-score for social support (0–6)								
>3	1.00		1.00		1.00		1.00	
≤3	0.98 (0.54–1.76)	0.945	1.04 (0.56–1.92)	0.901	3.51 (1.63–7.53)	0.001	2.78 (1.36–5.65)	0.005
Feeling at home in the Netherlands								
Very much/reasonably	1.00		1.00		1.00		1.00	
A little/not at all	2.31 (1.37–3.91)	0.002	1.01 (0.59–1.73)	0.977	2.04 (0.98–4.29)	0.058	1.71 (0.93–3.14)	0.083

Each variable has been adjusted for all other variables listed in the table and for marital status and education (data not shown)

OR Odds ratio, CI confidence interval, PTSD post-traumatic stress disorder