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Mental health of unaccompanied refugee minors during the asylum process: an observational cohort study

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ABSTRACT

Objectives: To examine the mental health of unaccompanied refugee minors (UM) prospectively during the asylum-seeking process, with a focus on specific stages in the asylum-process, such as age assessment, placement in a supportive or non-supportive facility, and final decision on the asylum applications.

Design: A two and a half year follow-up study of UM seeking asylum in Norway. Data were collected within three weeks (n=138), and at 4 months (n=101), 15 months (n=84) and 26 months (n=69) after arrival.

Setting: Initially in an observation and orientation centre for unaccompanied asylum-seeking adolescents, and subsequently wherever the UM were located in other refugee-facilities in Norway.

Participants: Male UM from Afghanistan, Somalia and Iran, with self-reported age 15-18.

Main outcome measures: Mental health symptoms assessed by Hopkins Symptom Checklist-25, and Harvard Trauma Questionnaire.

Results: At the group level the young asylum seekers reported high levels of psychological distress on arrival, and symptom levels that stayed relatively unchanged over time.

According to age-assessment procedures 56% of the population was not recognized as minors. Subsequent placement in a low- support facility was associated with higher levels of psychological distress in the follow-up period. Those who were placed in a reception centre for adults had higher levels of psychological distress symptoms both after 15 months and 26 months compared to the remaining participants who were placed in reception centers for youth. Refusal of asylum was highly associated with higher levels of psychological distress.

Conclusions: Mental health trajectory of young asylum-seekers appears to be negatively affected by low support and refusal of asylum.

Strengths and limitations of this study.

x. Strengths include a longitudinal design, with first assessment within three weeks after arrival to the host country, and repeated measures.

x. Use of computer-based assessment with audio-translations throughout the study.

x. Selection of participants was limited to the most common nationality groups arriving in Norway at the time of inclusion.

x. High attrition rate due to the fact that asylum seekers tend to move between and within countries, and that many were told to leave the country.

INTRODUCTION

In 2015 more than 88 700 unaccompanied minors (UM) fled to Europe¹, putting considerable pressure on these countries to provide the necessary resources needed. Separated children that are no longer protected by parents or other caregivers, usually have to be under the age of 18 in order to be given the special protection and care that is granted unaccompanied refugee minors. In the countries of origin for UM the civil registration service of their country often function poorly, and birth certificates can be lost, thrown away or falsified.² The scientific basis for assessing age is controversial, in that these tests only determine physical maturity, and are most uncertain from the age of 15 to 21, where natural variation is at its greatest.³ The consequences for many young asylum seekers assessed to be 18 years or older is that they will no longer be considered as minors, and therefore not receive special protection in accordance with the United Nations.²

Most studies investigating UM mental health have a cross-sectional design with a selection of youths with different levels of legal recognition and different durations of time in exile.⁴

These studies show consistently that individual factors such as exposure to violence and other traumatic events prior to migration, correspond to elevated symptoms of psychological distress.⁵ In some studies the negative effects of exile related stressors are also described⁶, yet they focus on youths with varying time in exile. There are different asylum-procedures within the different countries⁷, and most UM endure some uncertainty before their legal status is defined. Most countries provide some form of shelter for UM while they are waiting for their case to be processed, but conditions vary greatly. Positive health effects have been shown to be associated with receiving a permanent residence permit⁸, but this process may take months

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3 and sometimes years. The impact of different levels of social support that UM are offered,
4 especially after the first stage of reception and registration, have not been studied in detail.⁹
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7 The aim of our study was to examine UM's mental health during the asylum-seeking process,
8 and more specifically whether the official age assessed, level of support, and the outcome of
9 the asylum application were associated with UM's mental health at different stages of the
10 asylum seeking process.
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14 15 16 17 18 19 20 21 **METHODS** 22

23 24 25 26 **Participants and procedures** 27

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31 The sample in this study was a male convenience sample recruited from an observation and
32 orientation centre for unaccompanied asylum-seeking adolescents between ages 15 and 18
33 years, which was the only one in Norway at this time. In this reception centre, all UMs who
34 claimed to be in this age group stayed for the first weeks while asylum interviews and age-
35 assessment procedures were performed. A research assistant kept track of all new arrivals, and
36 each time our testing capacity allowed us to include some new participants, she was instructed
37 to invite the ones who had arrived most recently. The study was conducted between
38 September 2009 and March 2011. Altogether, the inclusion periods for this project were 12
39 weeks in 2009, 8 weeks in 2010, and 21 weeks in 2011. During these time periods young
40 asylum seekers came mainly from Afghanistan and Somalia. According to the statistics unit at
41 the Norwegian Directorate of Immigration, 406 male UM from these language groups arrived
42 in Norway during the inclusion periods. Unaccompanied males with self-reported age of 15 to
43 18, that had just arrived, were contacted by the research assistant. Altogether, 216
44 adolescents were asked to participate, and 209 returned the informed consent and attended the
45 study. Some participants were included in an Expressive Arts intervention group (n=71), that
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3 is not part of the present study. The remaining 138 are the focus of this article. More about the
4 whole project can be found on our home pages¹⁰.
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7 Information to participants included statements that participation would not impact the
8 chances to stay in the country. Only one contact attempt was made for each individual, and no
9 payment was offered.
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12 Participants followed the normal procedures in the asylum process. In Norway all UMs
13 receive assistance from a multi-disciplinary professional staff (educators, social workers,
14 psychologists, physicians, and nurses) in the first reception centre while waiting for their
15 “official-age” to be assigned. Those defined as 18 or older can be moved to adult housing
16 where less professional assistance is provided. The asylum-seekers considered to be from 15
17 to 18 years are moved to specialized youth centres, with staff available 24 hours, every day.
18 The youngest children stay in even more specialized orphanages. There are some exceptions
19 to this pattern, according to variable housing capacity some 18-year old asylum-seekers are
20 allowed to stay in the youth centres for some time. The youth centres are located all over
21 Norway, and have language classes for all inhabitants. Food is prepared and served by the
22 staff, and there are staff members available day and night. Most centres have recreational
23 activities, and they give individualised support and medical follow-up if needed. In an adult
24 centre, the asylum-seekers are left to themselves most of the time. They buy and cook their
25 own food, have no school or other scheduled activities, and have no guardians or staff
26 members to ask for advice.
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38 The first screening procedure was conducted within the first three weeks, and later repeated at
39 4 months (n=101), 15 months (n=84) and 26 months (n=69) after arrival. At the last
40 assessment the population was almost halved, mainly because many of the informants were
41 transported out of the country, or had disappeared from the different living facilities.
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51 **Measures**

52 Demographic data was registered with the aid of interpreters at the initial assessment. We
53 asked for self-reported age, literacy, years of school attendance, and whether their parents
54 were still alive, deceased, or if participants had lost touch with their parents and did not know.
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3 Later we registered the results of official age-assessments, especially which participants who
4 were thought to be at least 18 years of age. We also determined the level of care offered
5 according to placement in asylum centres for either adults or for youth. Before the last
6 assessment we registered the legal status, as participants were either given time-limited or
7 permanent permission to stay, or were refused legal residence in the country.
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10 Exposure

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12 Serious Life Events checklist (SLE), was developed by Tammy Bean and colleagues¹¹ in
13 order to assess if an adolescent meet the criteria A1 (experienced a traumatic event) in the
14 DSM-IV, for a diagnosis of PTSD. It is a self-report questionnaire which asks whether or not
15 the participant has experienced twelve different kinds of traumatic events, such as separation
16 from family, natural disaster, war and physical or sexual abuse. The instrument was scored by
17 answering yes or no on each item.
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26 Psychological distress

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28 Hopkins Symptom Checklist-25 (HSCL-25)¹² is a self-administered questionnaire designed to
29 measure anxiety and depression. It has been validated in various clinical and community
30 samples.^{13,14} The HSCL-37 A version is an extension of the HSCL-25, and has also been
31 applied in a number of refugee studies with minors.^{15,16} The additional 12 items measuring
32 externalizing behavior are not included in this paper. Each item was scored with 1 (not
33 bothered) to 4 (extremely bothered).
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42 Post Traumatic Symptom Score (PTSS)

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44 The Harvard Trauma Questionnaire¹⁷ is a comprehensive instrument that was developed to
45 assess potentially traumatic experiences and post-traumatic symptoms in various cultural
46 contexts. Its psychometric properties were first established in a highly traumatized, clinical
47 population, but it has also been evaluated with a larger community sample, and with asylum
48 seeking adolescents^{6,18}. The HTQ part IV, comprises 30 symptom items, among which the
49 first 16 items measure “The symptoms of PTSD” according to the DSM-IV.¹⁹ These 16 items
50 are scored with 1 (not at all) to 4 (extremely).
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Computer-based assessment

The chosen psychometric measurements were combined into a single questionnaire using the program MultiCASI²⁰. The questionnaires were filled in by the participants themselves, in their native languages, Dari, Pashto, Farsi or Somali, using laptops with touch-screen function. Translations had been attained from earlier projects, and were controlled by independent, native speaking, interpreters before they were added to the questionnaire. The items appeared one after the other on the screen, together with answering alternatives. All text had a sound-file connected to it that started as soon as the item appeared on the screen. The test could be used with any level of reading competence, and the sound of each item could be activated by touch, as many times as necessary. Items could be skipped and left unanswered, but would then be repeated once more towards the end of the questionnaire. The first introduction to the computer based self-screening was done shortly after arrival, with one language group at the time. An interpreter was present together with maximum five participants, as they were instructed in how to use the touch screen. They were encouraged to ask clarifying questions as they went on with answering the items, all in the same room, with earphones on, in order not to disturb each other. During the following waves of data collection the same questionnaire was used and translating services were not necessary. The results were transported digitally to the SPSS files.

Data analysis

Differences in HSCL and PTSS between 0, 4, 15 and 26 months were assessed by linear mixed effects models by categorical time, including an inter-individual random effect. Relationships between HSCL, and PTSS at each time point ≥ 4 months and characteristics known at that time point were assessed by unadjusted and linear regression. Specifically, covariates were being literate, parents deceased, number of adverse events and age assessed as ≥ 18 years at 4 months. At 15 months, being placed in a reception center for adults or youth, was included, and at 26 months also asylum status; permanent, time limited or refusal of asylum. Nonresponse analysis during follow up (4 to 26 months) used a generalized estimating equations (GEE) logistic regression by time and baseline HSCL score, reading ability, category for parents alive and number of serious life events. For descriptive analyses we used the SPSS version 22 for Windows. Beyond this, data was analyzed using R (The R Foundation for Statistical Computing, Vienna, Austria) with the R package nlme for mixed effects models and gee for GEE analyses²¹.

Table 1. Baseline characteristics of male unaccompanied refugee minors at arrival in Norway. Figures are given as number (%) when others not specified.

	N = 138
Age, self-reported	
Mean years (SD)	16.22 (0.84)
Range	15 - 18
Age, assessed by authorities	
Mean years(SD)	18.22 (2.27)
Range	15 - 28
Nationality	
Afghan	102 (73.9)
Somalian	32 (23.2)
Iranian	4 (2.9)
Literacy, self-reported	50 (36.8)
Loss of parent	
Father	85(62.9)
Mother	29(21.5)
Both	25(18.5)
Unknown	16(11.9)
Psychological distress (N=199)	
Mean HSCL (SD)	2.03 (0.58)
Caseness (n>2.0)	92 (46.2)
Posttraumatic stress (N=198)	
Mean PTSS (SD)	2.19 (0.58)
Caseness (n>2.0)	130 (64.4)

Results

Three fourths of the population came from Afghanistan, while the remaining came from Somalia and Iran (table 1). There were no significant differences between the countries of origin and the variables included in this article. A minority (36%) were able to read in their own language. Mean number of serious life-time events experienced was 6.3 (SD 2.3), range 1-11. Most of the participants (96%) had experienced at least one of the serious life events listed. The most frequently reported experiences were life threatening events (82%), physical abuse (78%), and loss of a close relative (78%). The official age assessment found a mean age of 18.4 years (SD 2.4), range 15-28, which meant that 72 (56%) participants were considered to be adults. Of this “adult” group, 36 participants were allowed to stay at the care centres for adolescents, while the rest had to move to centres for adults. None of the participants received psychiatric treatment during the study. Overall there were no significant changes in the level of symptoms within the study period ($p \geq .084$), neither for HSCL (Table 2) nor for PTSS.

Table 2. Mixed effect coefficients (MEC) for time modelling the course of psychological distress (HSCL) and posttraumatic stress (PTSS) in unaccompanied refugee minors after arrival in host country.

	HSCL			PTSS		
	MEC	95% CI	P	MEC	95% CI	P
Time			.136			.725
4 mo vs 0 mo	0.04	-0.09, 0.16	.557	0.02	-0.12, 0.15	.811
15 mo vs 0 mo	0.14	0.01, 0.27	.037	0.03	-0.11, 0.17	.671
26 mo vs 0 mo	-0.02	-0.16, 0.13	.831	-0.06	-0.21, 0.09	.441

HSCL : Hopkins symptom checklist

PTSS : Posttraumatic stress symptom checklist

Tables 3-5 show the associations between variables of interest, and symptoms of psychological distress at different test points. Outcome of age assessment, which was known shortly after the first assessment, had no significant association with psychological distress at 4 months (table 3). However, those who were estimated to be 18 years or older, had higher levels of symptoms at 15 months (table 4) and at 26 months (table 5), but not when adjusted for the outcome of the asylum-applications at the 26 month assessment.

Table 3. Regression coefficients for literacy, pre-migration bereavement, serious life-events and post-migration age assessment, related to course of psychological distress (HSCL) in young male asylum seekers 4 months after arrival in host country; unadjusted and adjusted results.

	Unadjusted			Adjusted		
	Coef.	95% CI	P	Coef.	95% CI	P
Being literate	0.348	0.115,0.581	.004	0.262	0.006, 0.518	.045
Parents deceased			.245			.457
Unknown vs both alive	0.175	-0.232,0.581	.396	0.146	-0.254, 0.545	.472
One dead vs both alive	0.146	-0.166,0.457	.355	0.182	-0.119, 0.483	.234
Both dead vs both alive	-0.172	-0.564,0.219	.384	-0.053	-0.442, 0.337	
Adverse events	0.066	0.015,0.116	.012	0.046	-0.006, 0.098	.084
Age assessed \geq 18 years	0.126	-0.118,0.370	.308	0.068	-0.191, 0.326	.604

HSCL: Hopkins symptom checklist

Adjusted for whether subjects participated in initial 5 week expressive arts group-intervention

Table 4. Regression coefficients for literacy, pre-migration bereavement, serious life-events and post-migration age assessment, in addition to asylum-seeker facilities, related to course of psychological distress (HSCL) in young male asylum seekers 15 months after arrival in host country; unadjusted and adjusted results.

	Unadjusted			Adjusted		
	Coef.	95% CI	P	Coef.	95% CI	P
Being literate	0.054	-0.254,0.363	.727	0.008	-0.296, 0.313	.957
Parents deceased			.134			.073
Unknown vs both alive	0.240	-0.278,0.757	.359	0.346	-0.133, 0.825	.154
One dead vs both alive	0.253	-0.141,0.646	.206	0.317	-0.051, 0.684	.090
Both dead vs both alive	0.581	0.097,1.065	.019	0.626	0.157, 1.094	.010
Adverse events	0.039	-0.030,0.107	.262	0.054	-0.010, 0.119	.099
Age assessed ≥18 years	0.522	0.238,0.805	<0.001	0.375	0.058, 0.692	.021
Adult reception center	0.464	0.136,0.792	.006	0.354	0.011, 0.695	.043

HSCL: Hopkins symptom checklist

Adjusted for whether subjects participated in initial 5 week expressive arts group-intervention

Table 5. Regression coefficients for literacy, pre-migration bereavement, serious life-events and post-migration age assessment, asylum-seeker facilities, in addition to asylum-status, related to course of psychological distress (HSCL) in young male asylum seekers 26 months after arrival in host country; unadjusted and adjusted results.

	Unadjusted			Adjusted		
	Coef.	95% CI	P	Coef.	95% CI	P
Being literate	0.025	-0.305,0.355	.881	-0.040	-0.322, 0.242	.777
Parents deceased			.043			.038
Unknown vs both alive	0.591	0.021,1.162	.042	0.562	0.076, 1.047	.024
One dead vs both alive	0.261	-0.130,0.652	.187	0.384	0.049, 0.719	.025
Both dead vs both alive	0.670	0.160,1.180	.011	0.532	0.088, 0.976	.020
Adverse events	-0.059	-0.126,-0.008	.083	-0.041	-0.097,0.016	.155
Age assessed ≥18 years	0.392	0.086,0.697	.013	-0.070	-0.428, 0.288	.696
Adult reception center	0.717	0.372,1.063	<.001	0.272	-0.169,0.712	.222
Asylum status (vs acceptance)			<.001			.017
Time-limited asylum	-0.035	-0.391,0.320	.844	-0.103	-0.498, 0.292	.602
Refusal of asylum	0.787	0.402,1.172	<.001	0.590	0.122, 1.059	.015

HSCL: Hopkins symptom checklist

Adjusted for whether subjects participated in initial 5 week expressive arts group-intervention

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3 One third of the participants were placed in a reception centre for adults. Figure 1 shows the
4 trajectories of psychological distress for participants placed in a reception centre for adults or
5 for youth. Those who were placed in a reception centre for adults had higher levels of
6 psychological distress symptoms both at 15 months (table 4) and 26 months (table 5)
7 compared to the remaining participants who were placed in reception centres for youth.
8 However, when adjusted for the outcome of the asylum application at the 26 month
9 assessment, the difference was not significant.
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15 Final decision on the asylum claims was given between the last two test points. Refusal was
16 highly associated with higher levels of psychological distress. Achieving time limited
17 residence permission was not significantly different compared to permanent asylum (table 5).
18 Trajectories of psychological distress for those who received refusal or acceptance of their
19 asylum application are illustrated graphically in figure 2. Refusal was related to the official
20 determined age of the asylum seeker. Among the participants who were considered to be 18
21 or more, 52 out of 72(72.2%) were refused, compared to 15 out of 59(25.4%) among the
22 participants who were considered to be under 18 (7 missing).
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29 The symptom scores of the PTSS (not illustrated in the tables) showed a similar association as
30 the HSCL-scores, with higher levels of PTSD-symptoms for those placed in a reception center
31 for adults at 15 months (adjusted difference 0.34, 95% CI 0.06 to 0.63, $p=0.017$), as well as
32 higher symptom scores for those who received a negative result for the asylum application at
33 26 months (adjusted difference 0.60, 95% CI 0.24 to 0.95, $p=0.001$).
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39 Loss to follow-up was not significantly related to initial levels of distress. Also, none of the
40 baseline covariates were significantly related to nonresponse.
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47 **DISCUSSION**

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49 The present study is a follow-up of unaccompanied refugee minors with four waves of
50 assessment from within three weeks after arrival to more than two years spent in the host
51 country. At the group level the young asylum seekers reported high levels of psychological
52 distress on arrival, and symptom levels that stayed relatively unchanged over time. A low
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3 level of support during the asylum process and a negative outcome of the asylum application
4 were associated with higher levels of psychological distress.
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7 Determination of the legal status of the asylum seekers involved age assessment procedures,
8 with x-rays and dental examinations for all participants in this study. This resulted in a
9 considerable gap between self reported age and the official age estimates designated by the
10 immigration authorities. On the basis of these examinations 55% of the asylum seekers were
11 considered to be at least the age of 18, and thus did not achieve a UM status. They risked
12 being moved to a facility for adults, with low levels of support and care, and limited access to
13 education and leisure activities. Also, the likelihood of being granted asylum was related to
14 age, as illustrated by the numbers of children and adults in our study who got refusal of their
15 claims.
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22 The results from our study is in agreement with other studies that have found that high-
23 support housing, with sufficient supervision, was associated with lower levels of
24 psychological symptoms⁵. Others have also described problems directly connected to the
25 asylum process, and have registered them as components in a list of post-migration stressors⁹.
26 A weakness with most of these studies, are cross-sectional designs where there are no base-
27 line measurements. Only a few studies have repeated assessments⁶ where problems directly
28 connected to the asylum process, such as age-assessment procedures, lack of adequate
29 housing, low support, etc., have been evaluated. The complexity of factors contributing to the
30 increasing health risk, make it difficult to draw specific conclusions within the total burden of
31 stressors.
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40 In all studies with UM, it is likely that there will be some uncertainty concerning the
41 participants' true chronological age³. Defined to be overage, in the present study, was not
42 significantly related to the symptom scores at the 4 month assessment, and there was no
43 indication that this process was stressful in itself. The age designated by the authorities,
44 determined what type of housing and level of care that was offered during the remaining
45 asylum-procedure. This meant that many of the participants had to live in a reception centre
46 for adults, where they had no guardian, no school, had to cook for themselves, and budget
47 their benefits. Our findings that this group had higher levels of psychological distress, add
48 further evidence that living conditions in the asylum seeking period may influence the mental
49 health of young refugees.^{6,9}
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3 The outcome of the individual asylum applications was revealed to the asylum seekers
4 between one and two years after the arrival, and the negative impact of refusal was as
5 expected, since several studies have found that difficulties obtaining legal residence are
6 associated with a range of psychological problems for this group⁶. We also know that
7 longitudinal studies indicate a trend towards reduction of mental health symptoms for
8 resettled refugees over time.²² In a follow-up study of 131 young refugees in Denmark, the
9 long term effects of pre-migration adversity were mediated by a variety of factors connected
10 to social life.²³ Another study suggests positive health effects upon receiving permanent
11 residence mediated through improved living conditions.²⁴ This, in association with our
12 findings, emphasizes the importance of a supportive post-migration environment for all
13 refugees with pre-migratory experiences of serious trauma and human rights violations.

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22 Strengths of our study include a longitudinal design, with first assessment within three weeks
23 after arrival to the host country, and repeated measures. We used computer-based assessment
24 with the same audio-translations throughout the study, and did not need to use interpreters in
25 order to complete the psychometric measures at follow-up. Selection of participants was
26 limited to the most common nationality groups arriving in Norway at the time of inclusion,
27 and may limit the generalization of our findings. High attrition rate due to the fact that asylum
28 seekers tend to move between and within countries, and that many were told to leave the
29 country, may have biased our findings. It is also possible that our research team was not
30 viewed as independent from the authorities, even though we stressed this fact when we
31 informed about the project. Finally, we have no data as to whether poor mental health might
32 have affected the likelihood of asylum. Mental health is generally not an issue in the
33 processing of asylum applications in Norway. Also, the baseline levels of mental health did
34 not differ between participants that later received asylum and those who did not.

46 47 **Implications**

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49 Our study shows that young asylum-seekers may spend considerable time in a safe Western
50 country, without recovering from the distress they have when they arrive in the host country.
51 A reason for the continuing psychological health problems in this non-clinical group of youth
52 can possibly be found in the living conditions and the level of care that is provided.
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3 Adolescence is a challenging transition-period for most people. Fleeing to a foreign country
4 without parents or other caregivers makes this life-period even more challenging for young
5 refugees, and puts a considerable responsibility on the receiving countries. The burden of
6 increasing numbers of asylum-seekers challenges the political intentions of the UN
7 Convention on the Rights of the Child (CRC) to always give precedence to “the best interest
8 of the child”.²⁵ It is emphasized that safety and dignity in the use of medical assessments
9 should be applied as a supplement to evaluations of the physical appearance and the
10 psychological maturity of the child. Needs of vulnerable adolescents and young adults in a
11 stressful life-situation deserve high priority and should be a main focus regardless of the
12 outcome of age assessments.²⁶

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20 In our society turning 18 is usually considered a transition point from child to adult. Yet with
21 the limitations of the age determining process we cannot know for certain that this milestone
22 has been reached. The consequences of this uncertainty can have legal, social and material
23 implications.²⁷ If a child is put under difficult living-conditions, where previous human
24 support and education is withdrawn, this can have unintended negative effects on these young
25 individuals transitioning into adulthood. Some child protection services argue that vulnerable
26 young adults are still in need of support and care after the age of 18²⁸, and need to receive
27 specialised care into their twenties.²⁹ Future studies should focus on how mental health and
28 resilience evolve over a longer time span, and evaluate specific interventions and appropriate
29 levels of care for young refugees.

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43 **Acknowledgement:** Gratitude to Liv Berit Løken for her care and assistance with all aspects
44 of the data collection. Thanks also to our very skilled interpreters, and to all the young
45 participants.

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49 **Contributors:** M. Jakobsen has had the main responsibility for the drafting and writing of the
50 article. Heir was, in collaboration with DeMott and Jakobsen, responsible for the literature
51 review and the conception and design of the article. DeMott and Jakobsen has been
52 responsible for all phases of the data collection. Data analysis and interpretation of data was
53 done in cooperation between Jakobsen, Heir and Wentzel-Larsen. All authors have
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contributed to the scientific writing and proof-reading of the article. The paper has been read and approved by all authors before submission.

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Data sharing statement: No additional data are available.

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Figures

Fig 1. Course of psychological distress (HSCL) during follow up of asylum seekers placed in asylum centers for adults (n=38) and asylum seekers placed in asylum centers for youth (n=100).

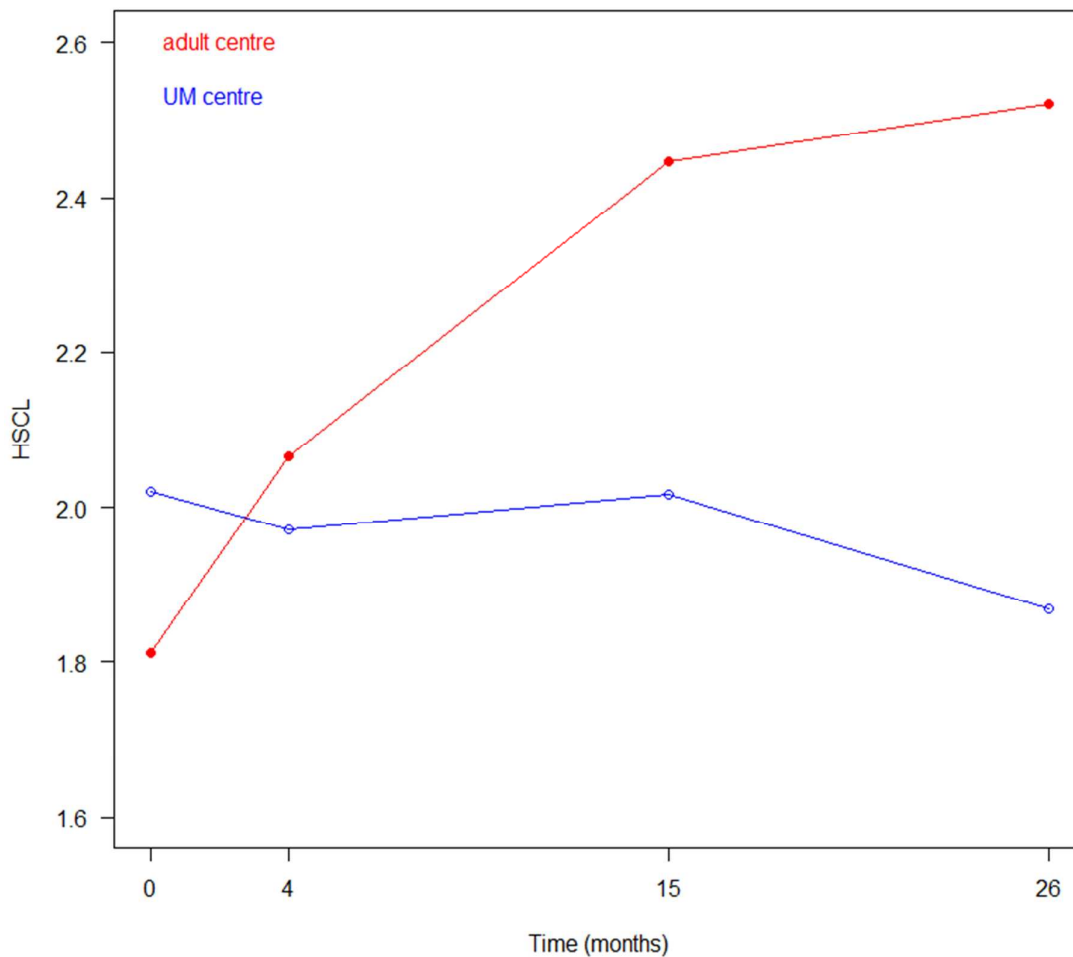
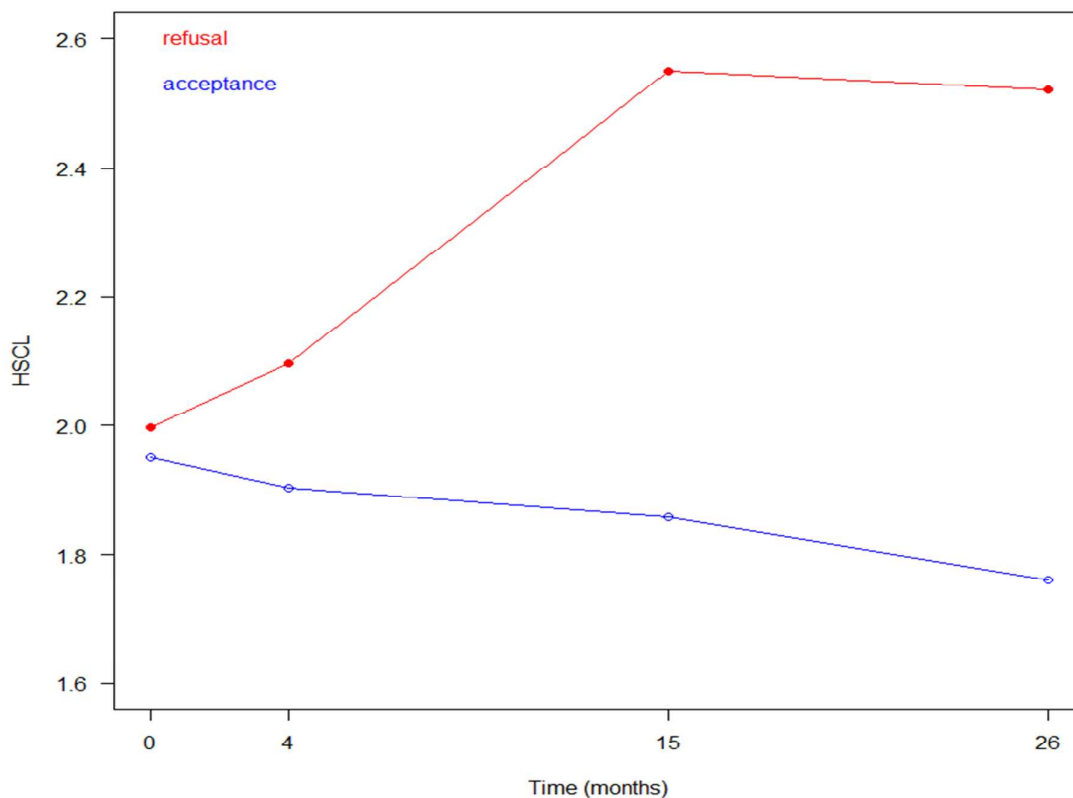


Fig 2. Course of psychological distress (HSCL) during follow up of asylum seekers who received refusal of asylum (n=67) and asylum seekers who received residence permission or time limited asylum (n=64).



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Research checklist

We have gone through the STROBE statement-Checklist list, and have tried to address all items in the article. We want to make some extra comments to these points:

10 and 13: This study has been conducted in cooperation with Norwegian immigration authorities, and there were restrictions on where and when we could gain access to the reception centers. The time periods when we were allowed to register are described in the article. We do not believe these restrictions impacted the selection of clients, since immigration to Norway happens all through the year, with very little control by the authorities. The restrictions were based on practical needs for turnover at the center, and we had to cooperate in order to do any research at all. The study size is the number of participants we were able to include within the designated time frames. It is hard to know how many participants we could have reached, since a lot of immigration is illegal, and asylum-seekers flee from the reception-centers all the time.

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Mental health and the impact of the asylum process: a longitudinal study of unaccompanied refugee minors.

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Mental health and the impact of the asylum process: a longitudinal study of unaccompanied refugee minors.

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ABSTRACT

Objectives: To examine the mental health of unaccompanied refugee minors (UM) prospectively during the asylum-seeking process, with a focus on specific stages in the asylum-process, such as age assessment, placement in a supportive or non-supportive facility, and final decision on the asylum applications.

Design: A two and a half year follow-up study of UM seeking asylum in Norway. Data were collected within three weeks (n=138), and at 4 months (n=101), 15 months (n=84) and 26 months (n=69) after arrival.

Setting: Initially in an observation and orientation centre for unaccompanied asylum-seeking adolescents, and subsequently wherever the UM were located in other refugee-facilities in Norway.

Participants: Male UM from Afghanistan, Somalia, Algeria and Iran.

Main outcome measures: Mental health symptoms assessed by Hopkins Symptom Checklist-25, and Harvard Trauma Questionnaire.

Results: At the group level the young asylum seekers reported high levels of psychological distress on arrival, and symptom levels that stayed relatively unchanged over time.

According to age-assessment procedures 56% of the population was not recognized as minors. Subsequent placement in a low- support facility was associated with higher levels of psychological distress in the follow-up period. Those who were placed in a reception centre for adults had higher levels of psychological distress symptoms both after 15 months and 26 months compared to the remaining participants who were placed in reception centers for youth. Refusal of asylum was highly associated with higher levels of psychological distress.

Conclusions: Mental health trajectory of young asylum-seekers appears to be negatively affected by low support and refusal of asylum.

Strengths and limitations of this study.

x. Strengths include a longitudinal design, with first assessment within three weeks after arrival to the host country, and repeated measures.

x. Use of computer-based assessment with audio-translations throughout the study.

x. Selection of participants was limited to the most common nationality groups arriving in Norway at the time of inclusion.

x. High attrition rate due to the fact that asylum seekers tend to move between and within countries, and that many were told to leave the country.

INTRODUCTION

In 2015 more than 88 700 unaccompanied minors (UM) fled to Europe¹, putting considerable pressure on these countries to provide the necessary resources needed. Separated children that are no longer protected by parents or other caregivers, usually have to be under the age of 18 in order to be given the special protection and care that is granted unaccompanied refugee minors. In the countries of origin for UM the civil registration service of their country often function poorly, and birth certificates can be lost, thrown away or falsified.² The scientific basis for assessing age is controversial, in that these tests only determine physical maturity, and are most uncertain from the age of 15 to 21, where natural variation is at its greatest.³ The consequences for many young asylum seekers assessed to be 18 years or older is that they will no longer be considered as minors, and therefore not receive special protection in accordance with the United Nations.²

Most studies investigating UM mental health have a cross-sectional design with a selection of youths with different levels of legal recognition and different durations of time in exile.⁴

These studies show consistently that individual factors such as exposure to violence and other traumatic events prior to migration, correspond to elevated symptoms of psychological distress.⁵ In some studies the negative effects of exile related stressors are also described⁶, yet they focus on youths with varying time in exile. There are different asylum-procedures within the different countries⁷, and most UM endure some uncertainty before their legal status is defined. Most countries provide some form of shelter for UM while they are waiting for their case to be processed, but conditions vary greatly. Positive health effects have been shown to be associated with receiving a permanent residence permit⁸, but this process may take months

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3 and sometimes years. The impact of different levels of social support that UM are offered,
4 especially after the first stage of reception and registration, have not been studied in detail.⁹
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7 The aim of our study was to examine UM's mental health during the asylum-seeking process,
8 and more specifically whether the official age assessed, level of support, and the outcome of
9 the asylum application were associated with UM's mental health at different stages of the
10 asylum seeking process.
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14 15 16 17 18 19 20 21 **METHODS**

22 23 24 25 26 **Participants and procedures**

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32 The sample in this study was recruited from an asylum reception centre for unaccompanied
33 asylum-seeking adolescents between ages 15 and 18 years, which was the only one in Norway
34 at this time. In this reception centre, all UMs who claimed to be in this age group stayed for
35 the first weeks while asylum interviews and age-assessment procedures were performed. A
36 research assistant kept track of all new arrivals, and each time our testing capacity allowed us
37 to include some new participants, she was instructed to invite the ones who had arrived most
38 recently. The study was conducted between September 2009 and March 2011. Altogether, the
39 inclusion periods for this project were 12 weeks in 2009, 8 weeks in 2010, and 21 weeks in
40 2011. During these time periods young asylum seekers came mainly from Afghanistan and
41 Somalia. According to the statistics unit at the Norwegian Directorate of Immigration, 406
42 male UM from these language groups arrived in Norway during the inclusion periods.
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45 Unaccompanied males that had just arrived were contacted by the research assistant.

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47 Altogether, 216 adolescents were asked to participate, and 209 returned the informed consent
48 and attended the study. Some participants were included in an Expressive Arts intervention
49 group (n=71), that is not part of the present study. The remaining 138 are the focus of this
50 article. Inclusion in the intervention-group was based on a randomizing –procedure shortly
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3 after arrival in Norway. The participants in the present article were not significantly different
4 from the intervention group in any baseline characteristics ($p \geq .071$).
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7 More about the whole project can be found on our home pages¹⁰.
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10 Information to participants included statements that participation would not impact the
11 chances to stay in the country. Only one contact attempt was made for each individual, and no
12 payment was offered.
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15 Participants followed the normal procedures in the asylum process. In Norway all UMs
16 receive assistance from a multi-disciplinary professional staff (educators, social workers,
17 psychologists, physicians, and nurses) in the first reception centre while waiting for their
18 “official-age” to be assigned. Those defined as 18 or older can be moved to adult housing
19 where less professional assistance is provided. The asylum-seekers considered to be from 15
20 to 18 years are moved to specialized youth centres, with staff available 24 hours, every day.
21 The youngest children stay in even more specialized orphanages. There are some exceptions
22 to this pattern, according to variable housing capacity some 18-year old asylum-seekers are
23 allowed to stay in the youth centres for some time. The youth centres are located all over
24 Norway, and have language classes for all inhabitants. Food is prepared and served by the
25 staff, and there are staff members available day and night. Most centres have recreational
26 activities, and they give individualised support and medical follow-up if needed. In an adult
27 centre, the asylum-seekers are left to themselves most of the time. They buy and cook their
28 own food, have no school or other scheduled activities, and have no guardians or staff
29 members to ask for advice.
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41 The first screening procedure was conducted within the first three weeks, and later repeated at
42 4 months ($n=101$), 15 months ($n=84$) and 26 months ($n=69$) after arrival. At the last
43 assessment the population was almost halved, mainly because many of the informants were
44 transported out of the country, or had disappeared from the different living facilities. The
45 participants who were deported were mostly individuals who had been registered as asylum-
46 seekers in another European country before coming to Norway, or individuals suspected of
47 having some connection to illegal activities. The ones who deflected were typically those who
48 feared deportation after their asylum-applications were turned down. It was, however,
49 impossible to obtain exact numbers and reasons for the attrition in this project.
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Measures

Demographic data was registered with the aid of interpreters at the initial assessment. We asked for self-reported age, literacy, years of school attendance, and whether their parents were still alive, deceased, or if participants had lost touch with their parents and did not know. Later we registered the results of official age-assessments, especially which participants who were thought to be at least 18 years of age. We also determined the level of care offered according to placement in asylum centres for either adults or for youth. Before the last assessment we registered the legal status, as participants were either given time-limited or permanent permission to stay, or were refused legal residence in the country.

Exposure

Serious Life Events checklist (SLE) was developed by Tammy Bean and colleagues¹¹ in order to assess if an adolescent meet the criteria A1 (experienced a traumatic event) in the DSM-IV, for a diagnosis of PTSD. It is a self-report questionnaire which asks whether or not the participant has experienced twelve different kinds of traumatic events, such as separation from family, natural disaster, war and physical or sexual abuse. The instrument was scored by answering yes or no on each item.

Psychological distress

Hopkins Symptom Checklist-25 (HSCL-25)¹² is a self-administered questionnaire designed to measure anxiety and depression. It has been validated in various clinical and community samples.^{13,14} The HSCL-37 A version is an extension of the HSCL-25, and has also been applied in a number of refugee studies with minors.^{15,16} The additional 12 items measuring externalizing behavior are not included in this paper. Each item was scored with 1 (not bothered) to 4 (extremely bothered). Scores ≥ 2.0 was considered probably clinically significant.¹⁷

Post Traumatic Symptom Score (PTSS)

The Harvard Trauma Questionnaire¹⁸ is a comprehensive instrument that was developed to assess potentially traumatic experiences and post-traumatic symptoms in various cultural

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3 contexts. Its psychometric properties were first established in a highly traumatized, clinical
4 population, but it has also been evaluated with a larger community sample, and with asylum
5 seeking adolescents^{6,19}. The HTQ part IV, comprises 30 symptom items, among which the
6 first 16 items measure “The symptoms of PTSD” according to the DSM–IV.²⁰ These 16 items
7 are scored with 1 (not at all) to 4 (extremely). Scores ≥ 2.0 was considered probably clinically
8 significant.¹⁷
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13 14 15 16 Computer-based assessment

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18 The chosen psychometric measurements were combined into a single questionnaire using the
19 program MultiCASI²¹. The questionnaires were filled in by the participants themselves, in
20 their native languages, Dari, Pashto, Farsi or Somali, using laptops with touch-screen function.
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22 Translations had been attained from earlier projects, and were controlled by independent,
23 native speaking, interpreters before they were added to the questionnaire. The items appeared
24 one after the other on the screen, together with answering alternatives. All text had a sound-
25 file connected to it that started as soon as the item appeared on the screen. The test could be
26 used with any level of reading competence, and the sound of each item could be activated by
27 touch, as many times as necessary. Items could be skipped and left unanswered, but would
28 then be repeated once more towards the end of the questionnaire. The first introduction to the
29 computer based self-screening was done shortly after arrival, with one language group at the
30 time. An interpreter was present together with maximum five participants, as they were
31 instructed in how to use the touch screen. They were encouraged to ask clarifying questions as
32 they went on with answering the items, all in the same room, with earphones on, in order not
33 to disturb each other. During the following waves of data collection the same questionnaire
34 was used and translating services were not necessary. The results were transported digitally to
35 the SPSS files.
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48 Data analysis

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50 Differences in HSCL and PTSS between 0, 4, 15 and 26 months were assessed by linear
51 mixed effects models by categorical time, including an inter-individual random effect.
52 Relationships between HSCL, and PTSS at each time point ≥ 4 months and characteristics
53 known at that time point were assessed by unadjusted and linear regression. Specifically,
54 covariates were being literate, parents deceased, number of adverse events and age assessed as
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≥18 years at 4 months. At 15 months, being placed in a reception center for adults or youth, was included, and at 26 months also asylum status; permanent, time limited or refusal of asylum. Due to a low number of missing values in the independent variables in the regression analyses (at most 3 missing values on any independent variable) complete case analysis was considered appropriate. Nonresponse analysis during follow up (4 to 26 months) used a generalized estimating equations (GEE) logistic regression by time and baseline HSCL score, reading ability, category for parents alive and number of serious life events. For descriptive analyses we used the SPSS version 22 for Windows. Beyond this, data was analyzed using R (The R Foundation for Statistical Computing, Vienna, Austria) with the R package nlme for mixed effects models and gee for GEE analyses²².

Table 1. Baseline characteristics of male unaccompanied refugee minors at arrival in Norway. Figures are given as number (%) when others not specified.

	N = 138
Age, self-reported (n=127)	
Mean years (SD)	16.18 (0.84)
Range	15 - 18
Age, assessed by authorities (n=132)	
Mean years(SD)	18.22 (2.27)
Range	15 - 27
Nationality	
Afghan	102 (73.9)
Somalian	32 (23.2)
Iranian	3 (2.2)
Algerian	1 (0.7)
Literacy, self-reported	50 (36.8)
Loss of parent	
Father	85(62.9)
Mother	29(21.5)

Both	25(18.5)
Unknown	16(11.9)
Psychological distress (n=132)	
Mean HSCL (SD)	1.70 (0.43)
Caseness (n>2.0)	29 (21.0)
Posttraumatic stress (n=133)	
Mean PTSS (SD)	2.15 (0.62)
Caseness (n>2.0)	81 (58.7)

Results

Three fourths of the population came from Afghanistan, while the remaining came from Somalia and Iran (table 1). There were no significant differences between the countries of origin and the variables included in this article. A minority (36%) were able to read in their own language. Mean number of serious life-time events experienced was 6.3 (SD 2.3), range 1-11. Most of the participants (96%) had experienced at least one of the serious life events listed. The most frequently reported experiences were life threatening events (82%), physical abuse (78%), and loss of a close relative (78%). The official age assessment found a mean age of 18.4 years (SD 2.4), range 15-28, which meant that 72 (56%) participants were considered to be adults. Of this “adult” group, 36 participants were allowed to stay at the care centres for adolescents, while the rest had to move to centres for adults. None of the participants received psychiatric treatment during the study. Overall there were no significant changes in the level of symptoms within the study period ($p \geq .084$), neither for HSCL (Table 2) nor for PTSS.

Table 2. Mixed effect coefficients (MEC) for time modelling the course of psychological distress (HSCL) and posttraumatic stress (PTSS) in unaccompanied refugee minors after arrival in host country.

	HSCL			PTSS		
	MEC	95% CI	P	MEC	95% CI	P
Time			.136			.725
4 mo vs 0 mo	0.04	-0.09, 0.16	.557	0.02	-0.12, 0.15	.811
15 mo vs 0 mo	0.14	0.01,0.27	.037	0.03	-0.11, 0.17	.671
26 mo vs 0 mo	-0.02	-0.16, 0.13	.831	-0.06	-0.21, 0.09	.441

HSCL : Hopkins symptom checklist

PTSS : Posttraumatic stress symptom checklist

Tables 3-5 show the associations between variables of interest, and symptoms of psychological distress at different test points. Outcome of age assessment, which was known shortly after the first assessment, had no significant association with psychological distress at 4 months (table 3). However, those who were estimated to be 18 years or older, had higher levels of symptoms at 15 months (table 4) and at 26 months (table 5), but not when adjusted for the outcome of the asylum-applications at the 26 month assessment.

Table 3. Regression coefficients for literacy, pre-migration bereavement, serious life-events and post-migration age assessment, related to course of psychological distress (HSCL) in young male asylum seekers 4 months after arrival in host country; unadjusted and adjusted results.

	Unadjusted			Adjusted		
	Coef.	95% CI	P	Coef.	95% CI	P
Being literate	0.348	0.115,0.581	.004	0.262	0.006, 0.518	.045
Parents deceased			.245			.457
Unknown vs both alive	0.175	-0.232,0.581	.396	0.146	-0.254, 0.545	.472

One dead vs both alive	0.146	-0.166,0.457	.355	0.182	-0.119, 0.483	.234
Both dead vs both alive	-0.172	-0.564,0.219	.384	-0.053	-0.442, 0.337	
Adverse events	0.066	0.015,0.116	.012	0.046	-0.006, 0.098	.084
Age assessed ≥18 years	0.126	-0.118,0.370	.308	0.068	-0.191, 0.326	.604

HSLC: Hopkins symptom checklist

Adjusted for whether subjects participated in initial 5 week expressive arts group-intervention

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Table 4. Regression coefficients for literacy, pre-migration bereavement, serious life-events and post-migration age assessment, in addition to asylum-seeker facilities, related to course of psychological distress (HSCL) in young male asylum seekers 15 months after arrival in host country; unadjusted and adjusted results.

	Unadjusted			Adjusted		
	Coef.	95% CI	P	Coef.	95% CI	P
Being literate	0.054	-0.254,0.363	.727	0.008	-0.296, 0.313	.957
Parents deceased			.134			.073
Unknown vs both alive	0.240	-0.278,0.757	.359	0.346	-0.133, 0.825	.154
One dead vs both alive	0.253	-0.141,0.646	.206	0.317	-0.051, 0.684	.090
Both dead vs both alive	0.581	0.097,1.065	.019	0.626	0.157, 1.094	.010
Adverse events	0.039	-0.030,0.107	.262	0.054	-0.010, 0.119	.099
Age assessed ≥18 years	0.522	0.238,0.805	<0.001	0.375	0.058, 0.692	.021
Adult reception center	0.464	0.136,0.792	.006	0.354	0.011, 0.695	.043

HSCL: Hopkins symptom checklist

Adjusted for whether subjects participated in initial 5 week expressive arts group-intervention

Table 5. Regression coefficients for literacy, pre-migration bereavement, serious life-events and post-migration age assessment, asylum-seeker facilities, in addition to asylum-status, related to course of psychological distress (HSCL) in young male asylum seekers 26 months after arrival in host country; unadjusted and adjusted results.

	Unadjusted			Adjusted		
	Coef.	95% CI	P	Coef.	95% CI	P
Being literate	0.025	-0.305,0.355	.881	-0.040	-0.322, 0.242	.777
Parents deceased			.043			.038
Unknown vs both alive	0.591	0.021,1.162	.042	0.562	0.076, 1.047	.024
One dead vs both alive	0.261	-0.130,0.652	.187	0.384	0.049, 0.719	.025
Both dead vs both alive	0.670	0.160,1.180	.011	0.532	0.088, 0.976	.020
Adverse events	-0.059	-0.126,-0.008	.083	-0.041	-0.097,0.016	.155
Age assessed ≥18 years	0.392	0.086,0.697	.013	-0.070	-0.428, 0.288	.696
Adult reception center	0.717	0.372,1.063	<.001	0.272	-0.169,0.712	.222
Asylum status (vs acceptance)			<.001			.017
Time-limited asylum	-0.035	-0.391,0.320	.844	-0.103	-0.498, 0.292	.602
Refusal of asylum	0.787	0.402,1.172	<.001	0.590	0.122, 1.059	.015

HSCL: Hopkins symptom checklist

Adjusted for whether subjects participated in initial 5 week expressive arts group-intervention

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3 One third of the participants were placed in a reception centre for adults. Figure 1 shows the
4 trajectories of psychological distress for participants placed in a reception centre for adults or
5 for youth. Those who were placed in a reception centre for adults had higher levels of
6 psychological distress symptoms both at 15 months (table 4) and 26 months (table 5)
7 compared to the remaining participants who were placed in reception centres for youth.
8 However, when adjusted for the outcome of the asylum application at the 26 month
9 assessment, the difference was not significant.
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15 Final decision on the asylum claims was given between the last two test points. Refusal was
16 highly associated with higher levels of psychological distress. Achieving time limited
17 residence permission was not significantly different compared to permanent asylum (table 5).
18 Trajectories of psychological distress for those who received refusal or acceptance of their
19 asylum application are illustrated graphically in figure 2. Refusal was related to the official
20 determined age of the asylum seeker. Among the participants who were considered to be 18
21 or more, 52 out of 72(72.2%) were refused, compared to 15 out of 59(25.4%) among the
22 participants who were considered to be under 18 (7 missing).
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29 The symptom scores of the PTSS (not illustrated in the tables) showed a similar association as
30 the HSCL-scores, with higher levels of PTSD-symptoms for those placed in a reception center
31 for adults at 15 months (adjusted difference 0.34, 95% CI 0.06 to 0.63, $p=0.017$), as well as
32 higher symptom scores for those who received a negative result for the asylum application at
33 26 months (adjusted difference 0.60, 95% CI 0.24 to 0.95, $p=0.001$).
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39 Loss to follow-up was not significantly related to initial levels of distress. Also, none of the
40 baseline covariates were significantly related to nonresponse.
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47 **DISCUSSION**

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49 The present study is a follow-up of unaccompanied refugee minors with four waves of
50 assessment from within three weeks after arrival to more than two years spent in the host
51 country. At the group level the young asylum seekers reported high levels of psychological
52 distress on arrival, and symptom levels that stayed relatively unchanged over time. A low
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3 level of support during the asylum process and a negative outcome of the asylum application
4 were associated with higher levels of psychological distress.
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7 Determination of the legal status of the asylum seekers involved age assessment procedures,
8 with x-rays and dental examinations for all participants in this study. This resulted in a
9 considerable gap between self reported age and the official age estimates designated by the
10 immigration authorities. On the basis of these examinations 55% of the asylum seekers were
11 considered to be at least the age of 18, and thus did not achieve a UM status. They risked
12 being moved to a facility for adults, with low levels of support and care, and limited access to
13 education and leisure activities. Also, the likelihood of being granted asylum was related to
14 age, as illustrated by the numbers of children and adults in our study who got refusal of their
15 claims.
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19 The results from our study is in agreement with other studies that have found that high-
20 support housing, with sufficient supervision, was associated with lower levels of
21 psychological symptoms⁵. Others have also described problems directly connected to the
22 asylum process, and have registered them as components in a list of post-migration stressors⁹.
23 A weakness with most of these studies, are cross-sectional designs where there are no base-
24 line measurements. Only a few studies have repeated assessments⁶ where problems directly
25 connected to the asylum process, such as age-assessment procedures, lack of adequate
26 housing, low support, etc., have been evaluated. The complexity of factors contributing to the
27 increasing health risk, make it difficult to draw specific conclusions within the total burden of
28 stressors.
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32 In all studies with UM, it is likely that there will be some uncertainty concerning the
33 participants' true chronological age³. Defined to be overage, in the present study, was not
34 significantly related to the symptom scores at the 4 month assessment, and there was no
35 indication that this process was stressful in itself. The age designated by the authorities,
36 determined what type of housing and level of care that was offered during the remaining
37 asylum-procedure. This meant that many of the participants had to live in a reception centre
38 for adults, where they had no guardian, no school, had to cook for themselves, and budget
39 their benefits. Our findings that this group had higher levels of psychological distress, add
40 further evidence that living conditions in the asylum seeking period may influence the mental
41 health of young refugees.^{6,9} It was probably known in the community and among the youth
42 that being categorized as an adult increased the risk of asylum refusal. This factor is
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3 impossible to separate from the expectations associated with the placement in youth or adult
4 reception-centres. There should be a cautious interpretation of the results because of this
5 clustering of risk factors.
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8 The outcome of the individual asylum applications was revealed to the asylum seekers
9 between one and two years after the arrival, and the negative impact of refusal was as
10 expected since several studies have found that difficulties obtaining legal residence are
11 associated with a range of psychological problems for this group⁶. We also know that
12 longitudinal studies indicate a trend towards reduction of mental health symptoms for
13 resettled refugees over time.²³ In a follow-up study of 131 young refugees in Denmark, the
14 long term effects of pre-migration adversity were mediated by a variety of factors connected
15 to social life.²⁴ Another study suggests positive health effects upon receiving permanent
16 residence mediated through improved living conditions.²⁵ This, in association with our
17 findings, emphasizes the importance of a supportive post-migration environment for all
18 refugees with pre-migratory experiences of serious trauma and human rights violations.
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27 Strengths of our study include a longitudinal design, with first assessment within three weeks
28 after arrival to the host country, and repeated measures. We used computer-based assessment
29 with the same audio-translations throughout the study, and did not need to use interpreters in
30 order to complete the psychometric measures at follow-up. Due to a random selection of
31 participants we consider the sample to be representative for the refugees arriving to Norway
32 in the first decade of the century. However, selection of participants was limited to the most
33 common nationality groups arriving in Norway in this period, and may limit the
34 generalization of our findings to refugees in general.
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41 High attrition rate due to the fact that asylum seekers tend to move between and within
42 countries, and that many were told to leave the country, may have biased our findings. It is
43 also possible that our research team was not viewed as independent from the authorities, even
44 though we stressed this fact when we informed about the project. Finally, we have no data as
45 to whether poor mental health might have affected the likelihood of asylum. Mental health is
46 generally not an issue in the processing of asylum applications in Norway. Also, the baseline
47 levels of mental health did not differ between participants that later received asylum and those
48 who did not.
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58 **Implications**

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3 Our study shows that young asylum-seekers may spend considerable time in a safe Western
4 country, without recovering from the distress they have when they arrive in the host country.
5 A reason for the continuing psychological health problems in this non-clinical group of youth
6 can possibly be found in the living conditions and the level of care that is provided.
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10 Adolescence is a challenging transition-period for most people. Fleeing to a foreign country
11 without parents or other caregivers makes this life-period even more challenging for young
12 refugees, and puts a considerable responsibility on the receiving countries. The burden of
13 increasing numbers of asylum-seekers challenges the political intentions of the UN
14 Convention on the Rights of the Child (CRC) to always give precedence to “the best interest
15 of the child”.²⁶ It is emphasized that safety and dignity in the use of medical assessments
16 should be applied as a supplement to evaluations of the physical appearance and the
17 psychological maturity of the child.
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20 An important objection to the use of dental/bone-age assessments is their lack of precision,
21 especially around the time of puberty. The tests have been criticized for their large margins of
22 error, and their inadequacy in determining chronological age.³ Professionals in various
23 countries have differed with some doctors refusing to take part in such tests, while others have
24 argued that these assessments are the best practice available.
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27 Needs of vulnerable adolescents and young adults in a stressful life-situation deserve high
28 priority and should be a main focus regardless of the outcome of age assessments.²⁷
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33 In our society turning 18 is usually considered a transition point from child to adult. Yet with
34 the limitations of the age determining process we cannot know for certain that this milestone
35 has been reached. The consequences of this uncertainty can have legal, social and material
36 implications.²⁸ If a child is put under difficult living-conditions, where previous human
37 support and education is withdrawn, this can have unintended negative effects on these young
38 individuals transitioning into adulthood. Some child protection services argue that vulnerable
39 young adults are still in need of support and care after the age of 18²⁹, and need to receive
40 specialised care into their twenties.³⁰ Future studies should focus on how mental health and
41 resilience evolve over a longer time span, and evaluate specific interventions and appropriate
42 levels of care for young refugees.
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Competing interests: None

Ethics approval: Regional Committees for Medical and Health Research Ethics.

Data sharing statement: No additional data are available.

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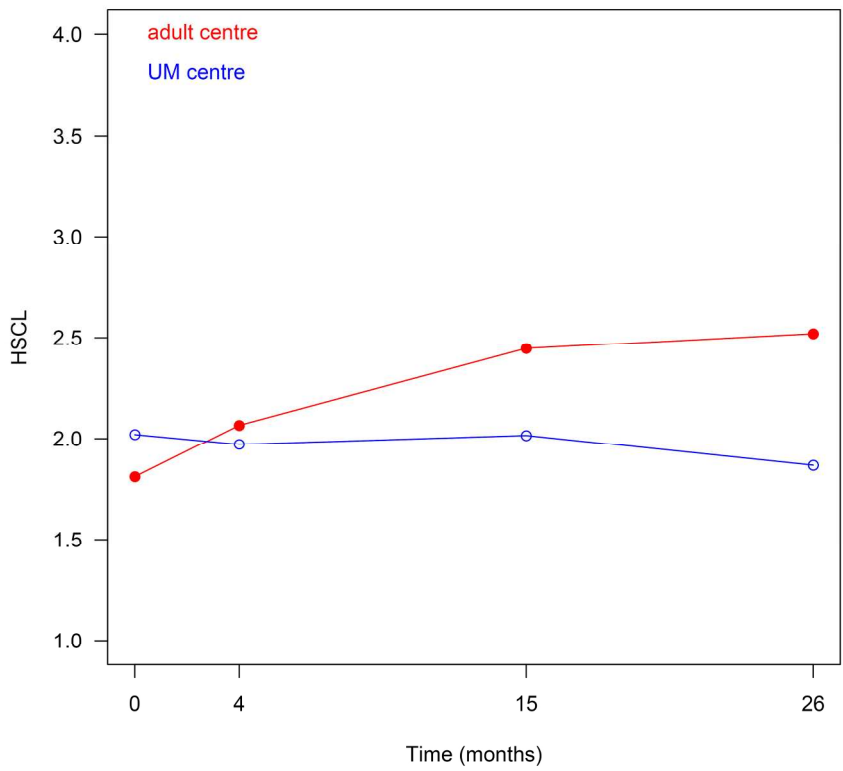
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Figure legends:

Fig 1. Course of psychological distress (HSCL) during follow up of asylum seekers placed in asylum centers for adults (n=38) and asylum seekers placed in asylum centers for youth (n=100).

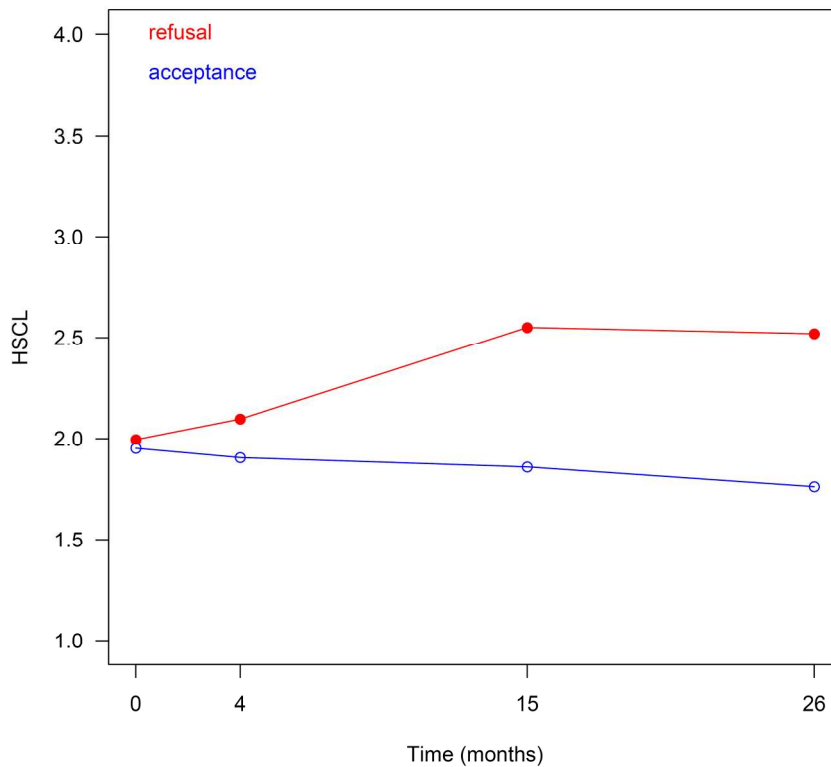
Fig 2. Course of psychological distress (HSCL) during follow up of asylum seekers who received refusal of asylum (n=67) and asylum seekers who received residence permission or time limited asylum (n=64).

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STROBE Statement—checklist of items that should be included in reports of observational studies

	Item No.	Recommendation	Page No.	Relevant text from manuscript
Title and abstract	1	(a) Indicate the study’s design with a commonly used term in the title or the abstract		Done: Longitudinal study
		(b) Provide in the abstract an informative and balanced summary of what was done and what was found		Done: see Abstract
Introduction				
Background/rationale	2	Explain the scientific background and rationale for the investigation being reported	3	Done: see introduction
Objectives	3	State specific objectives, including any prespecified hypotheses	4	Specified hypoth. not possible
Methods				
Study design	4	Present key elements of study design early in the paper	4-5	Done
Setting	5	Describe the setting, locations, and relevant dates, including periods of recruitment, exposure, follow-up, and data collection	5	Done
Participants	6	(a) <i>Cohort study</i> —Give the eligibility criteria, and the sources and methods of selection of participants. Describe methods of follow-up	4	Done: see introduction and methods
		<i>Case-control study</i> —Give the eligibility criteria, and the sources and methods of case ascertainment and control selection. Give the rationale for the choice of cases and controls		
		(b) <i>Cohort study</i> —For matched studies, give matching criteria and number of exposed and unexposed		N.a.
Variables	7	Clearly define all outcomes, exposures, predictors, potential confounders, and effect modifiers. Give diagnostic criteria, if applicable	6-7	Done: see methods (effect modifiers not included)
Data sources/ measurement	8*	For each variable of interest, give sources of data and details of methods of assessment (measurement). Describe comparability of assessment methods if there is more than one group	7	Done
Bias	9	Describe any efforts to address potential sources of bias	7-8	Done: see statistical methods
Study size	10	Explain how the study size was arrived at	4	Data collection was done in collaboration with immigration authorities. The numbers were determined by new arrivals during the periods we were allowed to be at the centre.

Continued on next page

Quantitative variables	11	Explain how quantitative variables were handled in the analyses. If applicable, describe which groupings were chosen and why	7-8	Done: see statistical methods
Statistical methods	12	(a) Describe all statistical methods, including those used to control for confounding	7-8	Done
		(b) Describe any methods used to examine subgroups and interactions	7-8	Done
		(c) Explain how missing data were addressed	7-8	Done.
		(d) <i>Cohort study</i> —If applicable, explain how loss to follow-up was addressed <i>Case-control study</i> —If applicable, explain how matching of cases and controls was addressed <i>Cross-sectional study</i> —If applicable, describe analytical methods taking account of sampling strategy		N.a.
		(e) Describe any sensitivity analyses		N.a.
Results				
Participants	13*	(a) Report numbers of individuals at each stage of study—eg numbers potentially eligible, examined for eligibility, confirmed eligible, included in the study, completing follow-up, and analysed	4	Done: see methods
		(b) Give reasons for non-participation at each stage	5	Uncertain
		(c) Consider use of a flow diagram		N.a.
Descriptive data	14*	(a) Give characteristics of study participants (eg demographic, clinical, social) and information on exposures and potential confounders	8-9	Done: see results and table 1
		(b) Indicate number of participants with missing data for each variable of interest		N.a.
		(c) <i>Cohort study</i> —Summarise follow-up time (eg, average and total amount)	5	Done: see methods
Outcome data	15*	<i>Cohort study</i> —Report numbers of outcome events or summary measures over time		Done: see tables 2-5
		<i>Case-control study</i> —Report numbers in each exposure category, or summary measures of exposure		
		<i>Cross-sectional study</i> —Report numbers of outcome events or summary measures		
Main results	16	(a) Give unadjusted estimates and, if applicable, confounder-adjusted estimates and their precision (eg, 95% confidence interval). Make clear which confounders were adjusted for and why they were included	10-13	Done
		(b) Report category boundaries when continuous variables were categorized	6-7	Done: see table 1 and measures
		(c) If relevant, consider translating estimates of relative risk into absolute risk for a meaningful time period		N.a.

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Other analyses	17	Report other analyses done—eg analyses of subgroups and interactions, and sensitivity analyses		N.a.
Discussion				
Key results	18	Summarise key results with reference to study objectives	9	Done
Limitations	19	Discuss limitations of the study, taking into account sources of potential bias or imprecision. Discuss both direction and magnitude of any potential bias	15-16	Done
Interpretation	20	Give a cautious overall interpretation of results considering objectives, limitations, multiplicity of analyses, results from similar studies, and other relevant evidence	15-17	Done
Generalisability	21	Discuss the generalisability (external validity) of the study results	16	Done
Other information				
Funding	22	Give the source of funding and the role of the funders for the present study and, if applicable, for the original study on which the present article is based	18	Done.

*Give information separately for cases and controls in case-control studies and, if applicable, for exposed and unexposed groups in cohort and cross-sectional studies.

Note: An Explanation and Elaboration article discusses each checklist item and gives methodological background and published examples of transparent reporting. The STROBE checklist is best used in conjunction with this article (freely available on the Web sites of PLoS Medicine at <http://www.plosmedicine.org/>, Annals of Internal Medicine at <http://www.annals.org/>, and Epidemiology at <http://www.epidem.com/>). Information on the STROBE Initiative is available at www.strobe-statement.org.

BMJ Open

Mental health and the impact of the asylum process: a longitudinal study of unaccompanied refugee minors.

Journal:	<i>BMJ Open</i>
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Primary Subject Heading:	Public health
Secondary Subject Heading:	Mental health
Keywords:	Refugee, Adolescent, Unaccompanied minor, Follow-up study, Norway

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Mental health and the impact of the asylum process: a longitudinal study of unaccompanied refugee minors.

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ABSTRACT

Objectives: To examine the mental health of unaccompanied refugee minors (UM) prospectively during the asylum-seeking process, with a focus on specific stages in the asylum-process, such as age assessment, placement in a supportive or non-supportive facility, and final decision on the asylum applications.

Design: A two and a half year follow-up study of UM seeking asylum in Norway. Data were collected within three weeks (n=138), and at 4 months (n=101), 15 months (n=84) and 26 months (n=69) after arrival.

Setting: Initially in an observation and orientation centre for unaccompanied asylum-seeking adolescents, and subsequently wherever the UM were located in other refugee-facilities in Norway.

Participants: Male UM from Afghanistan, Somalia, Algeria and Iran.

Main outcome measures: Mental health symptoms assessed by Hopkins Symptom Checklist-25, and Harvard Trauma Questionnaire.

Results: At the group level the young asylum seekers reported high levels of psychological distress on arrival, and symptom levels that stayed relatively unchanged over time.

According to age-assessment procedures 56% of the population was not recognized as minors. Subsequent placement in a low- support facility was associated with higher levels of psychological distress in the follow-up period. Those who were placed in a reception centre for adults had higher levels of psychological distress symptoms both after 15 months and 26 months compared to the remaining participants who were placed in reception centers for youth. Refusal of asylum was highly associated with higher levels of psychological distress.

Conclusions: Mental health trajectory of young asylum-seekers appears to be negatively affected by low support and refusal of asylum.

Strengths and limitations of this study.

x.Strengths include a longitudinal design, with first assessment within three weeks after arrival to the host country, and repeated measures.

x. Use of computer-based assessment with audio-translations throughout the study.

x.Selection of participants was limited to the most common nationality groups arriving in Norway at the time of inclusion.

x.High attrition rate due to the fact that asylum seekers tend to move between and within countries, and that many were told to leave the country.

INTRODUCTION

In 2015 more than 88 700 unaccompanied minors (UM) fled to Europe¹, putting considerable pressure on these countries to provide the necessary resources needed. Separated children that are no longer protected by parents or other caregivers, usually have to be under the age of 18 in order to be given the special protection and care that is granted unaccompanied refugee minors. In the countries of origin for UM the civil registration service of their country often function poorly, and birth certificates can be lost, thrown away or falsified.² The scientific basis for assessing age is controversial, in that these tests only determine physical maturity, and are most uncertain from the age of 15 to 21, where natural variation is at its greatest.³ The consequences for many young asylum seekers assessed to be 18 years or older is that they will no longer be considered as minors, and therefore not receive special protection in accordance with the United Nations.²

Most studies investigating UM mental health have a cross-sectional design with a selection of youths with different levels of legal recognition and different durations of time in exile.⁴

These studies show consistently that individual factors such as exposure to violence and other traumatic events prior to migration, correspond to elevated symptoms of psychological distress.⁵ In some studies the negative effects of exile related stressors are also described⁶, yet they focus on youths with varying time in exile. There are different asylum-procedures within the different countries⁷, and most UM endure some uncertainty before their legal status is defined. Most countries provide some form of shelter for UM while they are waiting for their case to be processed, but conditions vary greatly. Positive health effects have been shown to be associated with receiving a permanent residence permit⁸, but this process may take months

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3 and sometimes years. The impact of different levels of social support that UM are offered,
4 especially after the first stage of reception and registration, have not been studied in detail.⁹
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7 The aim of our study was to examine UM's mental health during the asylum-seeking process,
8 and more specifically whether the official age assessed, level of support, and the outcome of
9 the asylum application were associated with UM's mental health at different stages of the
10 asylum seeking process.
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14 15 16 17 18 19 20 21 **METHODS** 22

23 24 25 26 **Participants and procedures** 27

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32 The sample in this study was recruited from an asylum reception centre for unaccompanied
33 asylum-seeking adolescents between ages 15 and 18 years, which was the only one in Norway
34 at this time. In this reception centre, all UMs who claimed to be in this age group stayed for
35 the first weeks while asylum interviews and age-assessment procedures were performed. A
36 research assistant kept track of all new arrivals, and each time our testing capacity allowed us
37 to include some new participants, she was instructed to invite the ones who had arrived most
38 recently. The study was conducted between September 2009 and March 2011. Altogether, the
39 inclusion periods for this project were 12 weeks in 2009, 8 weeks in 2010, and 21 weeks in
40 2011. During these time periods young asylum seekers came mainly from Afghanistan and
41 Somalia. According to the statistics unit at the Norwegian Directorate of Immigration, 406
42 male UM from these language groups arrived in Norway during the inclusion periods.
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45 Unaccompanied males that had just arrived were contacted by the research assistant.
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47 Altogether, 216 adolescents were asked to participate, and 209 returned the informed consent
48 and attended the study. Some participants were included in an Expressive Arts intervention
49 group (n=71), that is not part of the present study. The remaining 138 are the focus of this
50 article. Inclusion in the intervention-group was based on a randomizing –procedure shortly
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3 after arrival in Norway. The participants in the present article were not significantly different
4 from the intervention group in any baseline characteristics ($p \geq .071$).
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7 More about the whole project can be found on our home pages¹⁰.
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10 Information to participants included statements that participation would not impact the
11 chances to stay in the country. Only one contact attempt was made for each individual, and no
12 payment was offered.
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15 Participants followed the normal procedures in the asylum process. In Norway all UMs
16 receive assistance from a multi-disciplinary professional staff (educators, social workers,
17 psychologists, physicians, and nurses) in the first reception centre while waiting for their
18 “official-age” to be assigned. Those defined as 18 or older can be moved to adult housing
19 where less professional assistance is provided. The asylum-seekers considered to be from 15
20 to 18 years are moved to specialized youth centres, with staff available 24 hours, every day.
21 The youngest children stay in even more specialized orphanages. There are some exceptions
22 to this pattern, according to variable housing capacity some 18-year old asylum-seekers are
23 allowed to stay in the youth centres for some time. The youth centres are located all over
24 Norway, and have language classes for all inhabitants. Food is prepared and served by the
25 staff, and there are staff members available day and night. Most centres have recreational
26 activities, and they give individualised support and medical follow-up if needed. In an adult
27 centre, the asylum-seekers are left to themselves most of the time. They buy and cook their
28 own food, have no school or other scheduled activities, and have no guardians or staff
29 members to ask for advice.
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41 The first screening procedure was conducted within the first three weeks, and later repeated at
42 4 months ($n=101$), 15 months ($n=84$) and 26 months ($n=69$) after arrival. At the last
43 assessment the population was almost halved, mainly because many of the informants were
44 transported out of the country, or had disappeared from the different living facilities. The
45 participants who were deported were mostly individuals who had been registered as asylum-
46 seekers in another European country before coming to Norway, or individuals suspected of
47 having some connection to illegal activities. The ones who deflected were typically those who
48 feared deportation after their asylum-applications were turned down. It was, however,
49 impossible to obtain exact numbers and reasons for the attrition in this project. When we
50 compared those who have completed all four assessments with those who missed out at one occasion
51 or more, there were no significant differences in any baseline demographic or symptom variables.
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Measures

Demographic data was registered with the aid of interpreters at the initial assessment. We asked for self-reported age, literacy, years of school attendance, and whether their parents were still alive, deceased, or if participants had lost touch with their parents and did not know. Later we registered the results of official age-assessments, especially which participants who were thought to be at least 18 years of age. We also determined the level of care offered according to placement in asylum centres for either adults or for youth. Before the last assessment we registered the legal status, as participants were either given time-limited or permanent permission to stay, or were refused legal residence in the country. New variables of interest such as level of care and legal status were included when they occurred prior to a new assessment.

Exposure

Serious Life Events checklist (SLE) was developed by Tammy Bean and colleagues¹¹ in order to assess if an adolescent meet the criteria A1 (experienced a traumatic event) in the DSM-IV, for a diagnosis of PTSD. It is a self-report questionnaire which asks whether or not the participant has experienced twelve different kinds of traumatic events, such as separation from family, natural disaster, war and physical or sexual abuse. The instrument was scored by answering yes or no on each item.

Psychological distress

Hopkins Symptom Checklist-25 (HSCL-25)¹² is a self-administered questionnaire designed to measure anxiety and depression. It has been validated in various clinical and community samples.^{13,14} The HSCL-37 A version is an extension of the HSCL-25, and has also been applied in a number of refugee studies with minors.^{15,16} The additional 12 items measuring externalizing behavior are not included in this paper. Each item was scored with 1 (not bothered) to 4 (extremely bothered). Scores ≥ 2.0 was considered probably clinically significant.¹⁷

Post Traumatic Symptom Score (PTSS)

The Harvard Trauma Questionnaire¹⁸ is a comprehensive instrument that was developed to assess potentially traumatic experiences and post-traumatic symptoms in various cultural contexts. Its psychometric properties were first established in a highly traumatized, clinical population, but it has also been evaluated with a larger community sample, and with asylum seeking adolescents^{6,19}. The HTQ part IV, comprises 30 symptom items, among which the first 16 items measure “The symptoms of PTSD” according to the DSM–IV.²⁰ These 16 items are scored with 1 (not at all) to 4 (extremely). Scores ≥ 2.0 was considered probably clinically significant.¹⁷

Computer-based assessment

The chosen psychometric measurements were combined into a single questionnaire using the program MultiCASI²¹. The questionnaires were filled in by the participants themselves, in their native languages, Dari, Pashto, Farsi or Somali, using laptops with touch-screen function. Translations had been attained from earlier projects, and were controlled by independent, native speaking, interpreters before they were added to the questionnaire. The items appeared one after the other on the screen, together with answering alternatives. All text had a sound-file connected to it that started as soon as the item appeared on the screen. The test could be used with any level of reading competence, and the sound of each item could be activated by touch, as many times as necessary. Items could be skipped and left unanswered, but would then be repeated once more towards the end of the questionnaire. The first introduction to the computer based self-screening was done shortly after arrival, with one language group at the time. An interpreter was present together with maximum five participants, as they were instructed in how to use the touch screen. They were encouraged to ask clarifying questions as they went on with answering the items, all in the same room, with earphones on, in order not to disturb each other. During the following waves of data collection the same questionnaire was used and translating services were not necessary. The results were transported digitally to the SPSS files.

Data analysis

Differences in HSCL and PTSS between 0, 4, 15 and 26 months were assessed by linear mixed effects models by categorical time, including an inter-individual random effect.

Relationships between HSCL, and PTSS at each time point ≥ 4 months and characteristics known at that time point were assessed by unadjusted and linear regression. Specifically, covariates were being literate, parents deceased, number of adverse events and age assessed as ≥ 18 years at 4 months. At 15 months, being placed in a reception center for adults or youth, was included, and at 26 months also asylum status; permanent, time limited or refusal of asylum. Due to a low number of missing values in the independent variables in the regression analyses (at most 3 missing values on any independent variable) complete case analysis was considered appropriate. Nonresponse analysis during follow up (4 to 26 months) used a generalized estimating equations (GEE) logistic regression by time and baseline HSCL score, reading ability, category for parents alive and number of serious life events. For descriptive analyses we used the SPSS version 22 for Windows. Beyond this, data was analyzed using R (The R Foundation for Statistical Computing, Vienna, Austria) with the R package nlme for mixed effects models and gee for GEE analyses²².

Table 1. Baseline characteristics of male unaccompanied refugee minors at arrival in Norway. Figures are given as number (%) when others not specified.

	N = 138
Age, self-reported (n=130)	
Mean years (SD)	16.22 (0.84)
Range	14 - 20
Age, assessed by authorities (n=132)	
Mean years(SD)	18.22 (2.27)
Range	15 - 27
Nationality	
Afghan	102 (73.9)
Somalian	32 (23.2)
Iranian	3 (2.2)
Algerian	1 (0.7)
Literacy, self-reported (n=136)	50 (36.8)

No loss of parent	30(21.7)
Loss of father	60(43.5)
Loss of mother	4(2.9)
Loss of both parents	25(18.5)
Unknown	16(11.9)
Psychological distress (n=131)	
Mean HSCL (SD)	1.94 (0.58)
Caseness (n \geq 2.0)	29 (21.0)
Posttraumatic stress (n=133)	
Mean PTSS (SD)	2.16 (0.62)
Caseness (n \geq 2.0)	81 (58.7)

Results

Three fourths of the population came from Afghanistan, while the remaining came from Somalia and Iran (table 1). There were no significant differences between the countries of origin and the variables included in this article. A minority (36%) were able to read in their own language. Mean number of serious life-time events experienced was 6.1 (SD 2.3), range 1-11. Most of the participants (96%) had experienced at least one of the serious life events listed. The most frequently reported experiences were life threatening events (82%), physical abuse (78%), and loss of a close relative (78%). The official age assessment found a mean age of 18.4 years (SD 2.4), range 15-28, which meant that 72 (56%) participants were considered to be adults. Of this “adult” group, 36 participants were allowed to stay at the care centres for adolescents, while the rest had to move to centres for adults. None of the participants received psychiatric treatment during the study. Overall there were no significant changes in the level of symptoms within the study period ($p \geq .084$), neither for HSCL (Table 2) nor for PTSS.

Table 2. Mixed effect coefficients (MEC) for time modelling the course of psychological distress (HSCL) and posttraumatic stress (PTSS) in unaccompanied refugee minors after arrival in host country.

	HSCL			PTSS		
	MEC	95% CI	P	MEC	95% CI	P
Time			.136			.725
4 mo vs 0 mo	0.04	-0.09, 0.16	.557	0.02	-0.12, 0.15	.811
15 mo vs 0 mo	0.14	0.01,0.27	.037	0.03	-0.11, 0.17	.671
26 mo vs 0 mo	-0.02	-0.16, 0.13	.831	-0.06	-0.21, 0.09	.441

HSCL : Hopkins symptom checklist

PTSS : Posttraumatic stress symptom checklist

Tables 3-5 show the associations between variables of interest, and symptoms of psychological distress at different test points. Outcome of age assessment, which was known shortly after the first assessment, had no significant association with psychological distress at 4 months (table 3). However, those who were estimated to be 18 years or older, had higher levels of symptoms at 15 months (table 4) and at 26 months (table 5), but not when adjusted for the outcome of the asylum-applications at the 26 month assessment.

Table 3. Regression coefficients for literacy, pre-migration bereavement, serious life-events and post-migration age assessment, related to course of psychological distress (HSCL) in young male asylum seekers 4 months after arrival in host country; results unadjusted and adjusted for the other variables.

	Unadjusted			Adjusted		
	Coef.	95% CI	P	Coef.	95% CI	P
Being literate	0.348	0.115,0.581	.004	0.262	0.006, 0.518	.045

Parents deceased			.245			.457
Unknown vs both alive	0.175	-0.232,0.581	.396	0.146	-0.254, 0.545	.472
One dead vs both alive	0.146	-0.166,0.457	.355	0.182	-0.119, 0.483	.234
Both dead vs both alive	-0.172	-0.564,0.219	.384	-0.053	-0.442, 0.337	
Adverse events	0.066	0.015,0.116	.012	0.046	-0.006, 0.098	.084
Age assessed ≥ 18 years	0.126	-0.118,0.370	.308	0.068	-0.191, 0.326	.604

HSCL: Hopkins symptom checklist

Table 4. Regression coefficients for literacy, pre-migration bereavement, serious life-events and post-migration age assessment, in addition to asylum-seeker facilities, related to course of psychological distress (HSCL) in young male asylum seekers 15 months after arrival in host country; results unadjusted and adjusted for the other variables.

	Unadjusted			Adjusted		
	Coef.	95% CI	P	Coef.	95% CI	P
Being literate	0.054	-0.254,0.363	.727	0.008	-0.296, 0.313	.957
Parents deceased			.134			.073
Unknown vs both alive	0.240	-0.278,0.757	.359	0.346	-0.133, 0.825	.154
One dead vs both alive	0.253	-0.141,0.646	.206	0.317	-0.051, 0.684	.090
Both dead vs both alive	0.581	0.097,1.065	.019	0.626	0.157, 1.094	.010
Adverse events	0.039	-0.030,0.107	.262	0.054	-0.010, 0.119	.099
Age assessed ≥18 years	0.522	0.238,0.805	<0.001	0.375	0.058, 0.692	.021
Adult reception center	0.464	0.136,0.792	.006	0.354	0.011, 0.695	.043

HSCL: Hopkins symptom checklist

Table 5. Regression coefficients for literacy, pre-migration bereavement, serious life-events and post-migration age assessment, asylum-seeker facilities, in addition to asylum-status, related to course of psychological distress (HSCL) in young male asylum seekers 26 months after arrival in host country; results unadjusted and adjusted for the other variables.

	Unadjusted			Adjusted		
	Coef.	95% CI	P	Coef.	95% CI	P
Being literate	0.025	-0.305,0.355	.881	-0.040	-0.322, 0.242	.777
Parents deceased			.043			.038
Unknown vs both alive	0.591	0.021,1.162	.042	0.562	0.076, 1.047	.024
One dead vs both alive	0.261	-0.130,0.652	.187	0.384	0.049, 0.719	.025
Both dead vs both alive	0.670	0.160,1.180	.011	0.532	0.088, 0.976	.020
Adverse events	-0.059	-0.126,-0.008	.083	-0.041	-0.097,0.016	.155
Age assessed ≥18 years	0.392	0.086,0.697	.013	-0.070	-0.428, 0.288	.696
Adult reception center	0.717	0.372,1.063	<.001	0.272	-0.169,0.712	.222
Asylum status (vs acceptance)			<.001			.017
Time-limited asylum	-0.035	-0.391,0.320	.844	-0.103	-0.498, 0.292	.602
Refusal of asylum	0.787	0.402,1.172	<.001	0.590	0.122, 1.059	.015

HSCL: Hopkins symptom checklist

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3 One third of the participants were placed in a reception centre for adults. Figure 1 shows the
4 trajectories of psychological distress for participants placed in a reception centre for adults or
5 for youth. Those who were placed in a reception centre for adults had higher levels of
6 psychological distress symptoms both at 15 months (table 4) and 26 months (table 5)
7 compared to the remaining participants who were placed in reception centres for youth.
8 However, when adjusted for the outcome of the asylum application at the 26 month
9 assessment, the difference was not significant.
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15 Final decision on the asylum claims was given between the last two test points. Refusal was
16 highly associated with higher levels of psychological distress. Achieving time limited
17 residence permission was not significantly different compared to permanent asylum (table 5).
18 Trajectories of psychological distress for those who received refusal or acceptance of their
19 asylum application are illustrated graphically in figure 2. Refusal was related to the official
20 determined age of the asylum seeker. Among the participants who were considered to be 18
21 or more, 52 out of 72(72.2%) were refused, compared to 15 out of 59(25.4%) among the
22 participants who were considered to be under 18 (7 missing).
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29 The symptom scores of the PTSS (not illustrated in the tables) showed a similar association as
30 the HSCL-scores, with higher levels of PTSD-symptoms for those placed in a reception center
31 for adults at 15 months (adjusted difference 0.34, 95% CI 0.06 to 0.63, $p=0.017$), as well as
32 higher symptom scores for those who received a negative result for the asylum application at
33 26 months (adjusted difference 0.60, 95% CI 0.24 to 0.95, $p=0.001$).
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39 Loss to follow-up was not significantly related to initial levels of distress. Also, none of the
40 baseline covariates were significantly related to nonresponse.
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47 **DISCUSSION**

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49 The present study is a follow-up of unaccompanied refugee minors with four waves of
50 assessment from within three weeks after arrival to more than two years spent in the host
51 country. At the group level the young asylum seekers reported high levels of psychological
52 distress on arrival, and symptom levels that stayed relatively unchanged over time. A low
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3 level of support during the asylum process and a negative outcome of the asylum application
4 were associated with higher levels of psychological distress.
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7 Determination of the legal status of the asylum seekers involved age assessment procedures,
8 with x-rays and dental examinations for all participants in this study. This resulted in a
9 considerable gap between self reported age and the official age estimates designated by the
10 immigration authorities. On the basis of these examinations 55% of the asylum seekers were
11 considered to be at least the age of 18, and thus did not achieve a UM status. They risked
12 being moved to a facility for adults, with low levels of support and care, and limited access to
13 education and leisure activities. Also, the likelihood of being granted asylum was related to
14 age, as illustrated by the numbers of children and adults in our study who got refusal of their
15 claims.
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19 The results from our study is in agreement with other studies that have found that high-
20 support housing, with sufficient supervision, was associated with lower levels of
21 psychological symptoms⁵. Others have also described problems directly connected to the
22 asylum process, and have registered them as components in a list of post-migration stressors⁹.
23 A weakness with most of these studies, are cross-sectional designs where there are no base-
24 line measurements. Only a few studies have repeated assessments⁶ where problems directly
25 connected to the asylum process, such as age-assessment procedures, lack of adequate
26 housing, low support, etc., have been evaluated. The complexity of factors contributing to the
27 increasing health risk, make it difficult to draw specific conclusions within the total burden of
28 stressors.
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32 In all studies with UM, it is likely that there will be some uncertainty concerning the
33 participants' true chronological age³. Defined to be overage, in the present study, was not
34 significantly related to the symptom scores at the 4 month assessment, and there was no
35 indication that this process was stressful in itself. The age designated by the authorities,
36 determined what type of housing and level of care that was offered during the remaining
37 asylum-procedure. This meant that many of the participants had to live in a reception centre
38 for adults, where they had no guardian, no school, had to cook for themselves, and budget
39 their benefits. Our findings that this group had higher levels of psychological distress, add
40 further evidence that living conditions in the asylum seeking period may influence the mental
41 health of young refugees.^{6,9} It was probably known in the community and among the youth
42 that being categorized as an adult increased the risk of asylum refusal. This factor is
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3 impossible to separate from the expectations associated with the placement in youth or adult
4 reception-centres. There should be a cautious interpretation of the results because of this
5 clustering of risk factors. It is also possible that the asylum interviews were more adversarial
6 for those who had adverse age assessments. These interviews happened early in the asylum-
7 trajectories, but these official age assessments may have been used to question testimonial
8 credibility in the asylum process.
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12 The outcome of the individual asylum applications was revealed to the asylum seekers
13 between one and two years after the arrival, and the negative impact of refusal was as
14 expected since several studies have found that difficulties obtaining legal residence are
15 associated with a range of psychological problems for this group⁶. We also know that
16 longitudinal studies indicate a trend towards reduction of mental health symptoms for
17 resettled refugees over time.²³ In a follow-up study of 131 young refugees in Denmark, the
18 long term effects of pre-migration adversity were mediated by a variety of factors connected
19 to social life.²⁴ Another study suggests positive health effects upon receiving permanent
20 residence mediated through improved living conditions.²⁵ This, in association with our
21 findings, emphasizes the importance of a supportive post-migration environment for all
22 refugees with pre-migratory experiences of serious trauma and human rights violations.
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32 Strengths of our study include a longitudinal design, with first assessment within three weeks
33 after arrival to the host country, and repeated measures. We used computer-based assessment
34 with the same audio-translations throughout the study, and did not need to use interpreters in
35 order to complete the psychometric measures at follow-up. Due to a random selection of
36 participants we consider the sample to be representative for the refugees arriving to Norway
37 in the first decade of the century. However, selection of participants was limited to the most
38 common nationality groups arriving in Norway in this period, and may limit the
39 generalization of our findings to refugees in general.
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46 High attrition rate due to the fact that asylum seekers tend to move between and within
47 countries, and that many were told to leave the country, may have biased our findings. It is
48 also possible that our research team was not viewed as independent from the authorities, even
49 though we stressed this fact when we informed about the project. Finally, we have no data as
50 to whether poor mental health might have affected the likelihood of asylum. Mental health is
51 generally not an issue in the processing of asylum applications in Norway. Also, the baseline
52 levels of mental health did not differ between participants that later received asylum and those
53 who did not.
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Implications

Our study shows that young asylum-seekers may spend considerable time in a safe Western country, without recovering from the distress they have when they arrive in the host country. A reason for the continuing psychological health problems in this non-clinical group of youth can possibly be found in the living conditions and the level of care that is provided.

Adolescence is a challenging transition-period for most people. Fleeing to a foreign country without parents or other caregivers makes this life-period even more challenging for young refugees, and puts a considerable responsibility on the receiving countries. The burden of increasing numbers of asylum-seekers challenges the political intentions of the UN Convention on the Rights of the Child (CRC) to always give precedence to “the best interest of the child”.²⁶ It is emphasized that safety and dignity in the use of medical assessments should be applied as a supplement to evaluations of the physical appearance and the psychological maturity of the child.

An important objection to the use of dental/bone-age assessments is their lack of precision, especially around the time of puberty. The tests have been criticized for their large margins of error, and their inadequacy in determining chronological age.³ Professionals in various countries have differed with some doctors refusing to take part in such tests, while others have argued that these assessments are the best practice available.

Needs of vulnerable adolescents and young adults in a stressful life-situation deserve high priority and should be a main focus regardless of the outcome of age assessments.²⁷ It is noteworthy that access to psychiatric care was not evident for any of the participants although a majority of this sample had symptom levels suggesting a positive diagnosis of PTSD. This may reflect a lack of resources available for this population or reluctance to ask for health care.

In our society turning 18 is usually considered a transition point from child to adult. Yet with the limitations of the age determining process we cannot know for certain that this milestone has been reached. The consequences of this uncertainty can have legal, social and material implications.²⁸ If a child is put under difficult living-conditions, where previous human support and education is withdrawn, this can have unintended negative effects on these young individuals transitioning into adulthood. Some child protection services argue that vulnerable

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3 young adults are still in need of support and care after the age of 18²⁹, and need to receive
4 specialised care into their twenties.³⁰ Future studies should focus on how mental health and
5 resilience evolve over a longer time span, and evaluate specific interventions and appropriate
6 levels of care for young refugees.
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14 **Acknowledgement:** Gratitude to Liv Berit Løken for her care and assistance with all aspects
15 of the data collection. Thanks also to our very skilled interpreters, and to all the young
16 participants.
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22 article. Heir was, in collaboration with DeMott and Jakobsen, responsible for the literature
23 review and the conception and design of the article. DeMott and Jakobsen has been
24 responsible for all phases of the data collection. Data analysis and interpretation of data was
25 done in cooperation between Jakobsen, Heir and Wentzel-Larsen. All authors have
26 contributed to the scientific writing and proof-reading of the article. The paper has been read
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34

35 **Competing interests:** None
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37 **Ethics approval:** Regional Committees for Medical and Health Research Ethics.
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40 **Data sharing statement:** No additional data are available.
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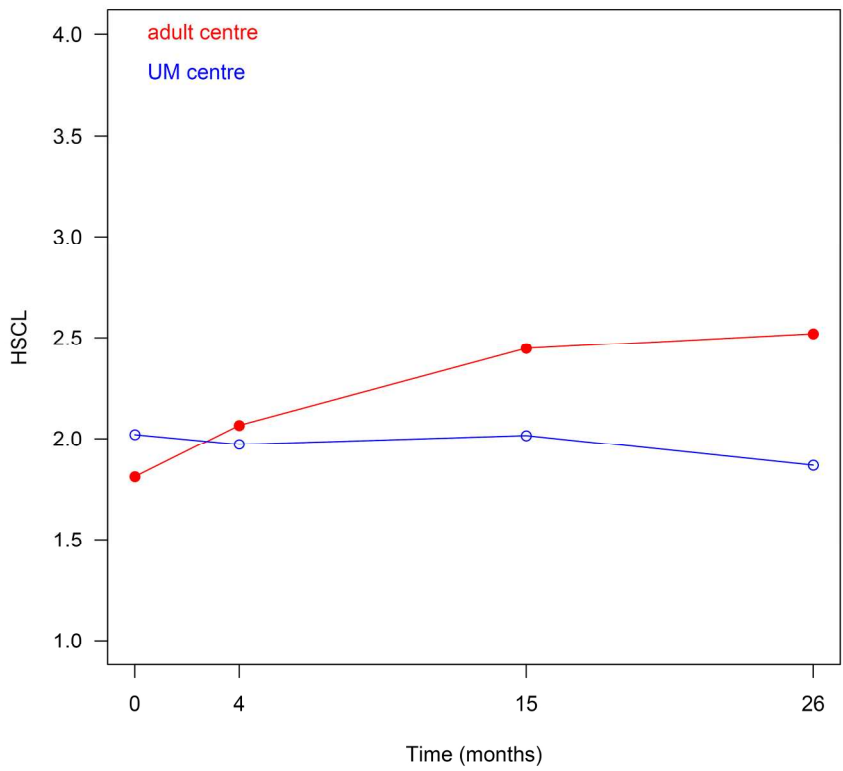
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Figure legends:

Fig 1. Course of psychological distress (HSCL) during follow up of asylum seekers placed in asylum centers for adults (n=38) and asylum seekers placed in asylum centers for youth (n=100).

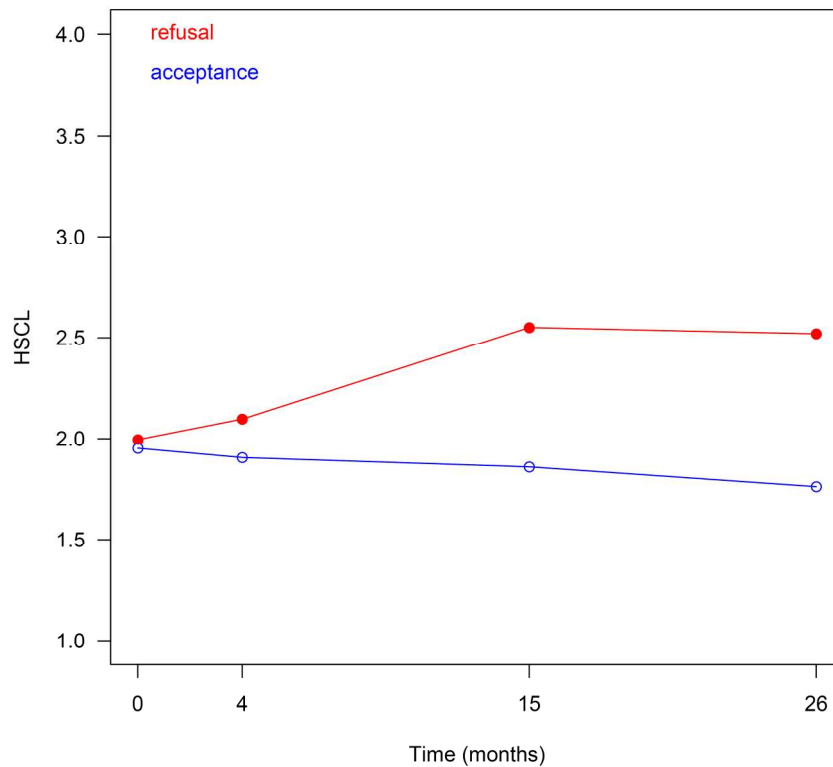
Fig 2. Course of psychological distress (HSCL) during follow up of asylum seekers who received refusal of asylum (n=67) and asylum seekers who received residence permission or time limited asylum (n=64).

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STROBE Statement—checklist of items that should be included in reports of observational studies

	Item No.	Recommendation	Page No.	Relevant text from manuscript
Title and abstract	1	(a) Indicate the study’s design with a commonly used term in the title or the abstract		Done: Longitudinal study
		(b) Provide in the abstract an informative and balanced summary of what was done and what was found		Done: see Abstract
Introduction				
Background/rationale	2	Explain the scientific background and rationale for the investigation being reported	3	Done: see introduction
Objectives	3	State specific objectives, including any prespecified hypotheses	4	Specified hypoth. not possible
Methods				
Study design	4	Present key elements of study design early in the paper	4-5	Done
Setting	5	Describe the setting, locations, and relevant dates, including periods of recruitment, exposure, follow-up, and data collection	5	Done
Participants	6	(a) <i>Cohort study</i> —Give the eligibility criteria, and the sources and methods of selection of participants. Describe methods of follow-up	4	Done: see introduction and methods
		<i>Case-control study</i> —Give the eligibility criteria, and the sources and methods of case ascertainment and control selection. Give the rationale for the choice of cases and controls		
		(b) <i>Cohort study</i> —For matched studies, give matching criteria and number of exposed and unexposed		N.a.
Variables	7	Clearly define all outcomes, exposures, predictors, potential confounders, and effect modifiers. Give diagnostic criteria, if applicable	6-7	Done: see methods (effect modifiers not included)
Data sources/ measurement	8*	For each variable of interest, give sources of data and details of methods of assessment (measurement). Describe comparability of assessment methods if there is more than one group	7	Done
Bias	9	Describe any efforts to address potential sources of bias	7-8	Done: see statistical methods
Study size	10	Explain how the study size was arrived at	4	Data collection was done in collaboration with immigration authorities. The numbers were determined by new arrivals during the periods we were allowed to be at the centre.

Continued on next page

Quantitative variables	11	Explain how quantitative variables were handled in the analyses. If applicable, describe which groupings were chosen and why	7-8	Done: see statistical methods
Statistical methods	12	(a) Describe all statistical methods, including those used to control for confounding	7-8	Done
		(b) Describe any methods used to examine subgroups and interactions	7-8	Done
		(c) Explain how missing data were addressed	7-8	Done.
		(d) <i>Cohort study</i> —If applicable, explain how loss to follow-up was addressed <i>Case-control study</i> —If applicable, explain how matching of cases and controls was addressed <i>Cross-sectional study</i> —If applicable, describe analytical methods taking account of sampling strategy		N.a.
		(e) Describe any sensitivity analyses		N.a.
Results				
Participants	13*	(a) Report numbers of individuals at each stage of study—eg numbers potentially eligible, examined for eligibility, confirmed eligible, included in the study, completing follow-up, and analysed	4	Done: see methods
		(b) Give reasons for non-participation at each stage	5	Uncertain
		(c) Consider use of a flow diagram		N.a.
Descriptive data	14*	(a) Give characteristics of study participants (eg demographic, clinical, social) and information on exposures and potential confounders	8-9	Done: see results and table 1
		(b) Indicate number of participants with missing data for each variable of interest		N.a.
		(c) <i>Cohort study</i> —Summarise follow-up time (eg, average and total amount)	5	Done: see methods
Outcome data	15*	<i>Cohort study</i> —Report numbers of outcome events or summary measures over time		Done: see tables 2-5
		<i>Case-control study</i> —Report numbers in each exposure category, or summary measures of exposure		
		<i>Cross-sectional study</i> —Report numbers of outcome events or summary measures		
Main results	16	(a) Give unadjusted estimates and, if applicable, confounder-adjusted estimates and their precision (eg, 95% confidence interval). Make clear which confounders were adjusted for and why they were included	10-13	Done
		(b) Report category boundaries when continuous variables were categorized	6-7	Done: see table 1 and measures
		(c) If relevant, consider translating estimates of relative risk into absolute risk for a meaningful time period		N.a.

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Other analyses	17	Report other analyses done—eg analyses of subgroups and interactions, and sensitivity analyses		N.a.
Discussion				
Key results	18	Summarise key results with reference to study objectives	9	Done
Limitations	19	Discuss limitations of the study, taking into account sources of potential bias or imprecision. Discuss both direction and magnitude of any potential bias	15-16	Done
Interpretation	20	Give a cautious overall interpretation of results considering objectives, limitations, multiplicity of analyses, results from similar studies, and other relevant evidence	15-17	Done
Generalisability	21	Discuss the generalisability (external validity) of the study results	16	Done
Other information				
Funding	22	Give the source of funding and the role of the funders for the present study and, if applicable, for the original study on which the present article is based	18	Done.

*Give information separately for cases and controls in case-control studies and, if applicable, for exposed and unexposed groups in cohort and cross-sectional studies.

Note: An Explanation and Elaboration article discusses each checklist item and gives methodological background and published examples of transparent reporting. The STROBE checklist is best used in conjunction with this article (freely available on the Web sites of PLoS Medicine at <http://www.plosmedicine.org/>, Annals of Internal Medicine at <http://www.annals.org/>, and Epidemiology at <http://www.epidem.com/>). Information on the STROBE Initiative is available at www.strobe-statement.org.

BMJ Open

The impact of the asylum process on mental health: a longitudinal study of unaccompanied refugee minors in Norway

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Primary Subject Heading:	Public health
Secondary Subject Heading:	Mental health
Keywords:	Refugee, Adolescent, Unaccompanied minor, Follow-up study, Norway

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The impact of the asylum process on mental health: a longitudinal study of unaccompanied refugee minors in Norway

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ABSTRACT

Objectives: To examine the mental health of unaccompanied refugee minors (UM) prospectively during the asylum-seeking process, with a focus on specific stages in the asylum-process, such as age assessment, placement in a supportive or non-supportive facility, and final decision on the asylum applications.

Design: A two and a half year follow-up study of UM seeking asylum in Norway. Data were collected within three weeks (n=138), and at 4 months (n=101), 15 months (n=84) and 26 months (n=69) after arrival.

Setting: Initially in an observation and orientation centre for unaccompanied asylum-seeking adolescents, and subsequently wherever the UM were located in other refugee-facilities in Norway.

Participants: Male UM from Afghanistan, Somalia, Algeria and Iran.

Main outcome measures: Mental health symptoms assessed by Hopkins Symptom Checklist-25, and Harvard Trauma Questionnaire.

Results: At the group level the young asylum seekers reported high levels of psychological distress on arrival, and symptom levels that stayed relatively unchanged over time.

According to age-assessment procedures 56% of the population was not recognized as minors. Subsequent placement in a low- support facility was associated with higher levels of psychological distress in the follow-up period. Those who were placed in a reception centre for adults had higher levels of psychological distress symptoms both after 15 months and 26 months compared to the remaining participants who were placed in reception centers for youth. Refusal of asylum was highly associated with higher levels of psychological distress.

Conclusions: Mental health trajectory of young asylum-seekers appears to be negatively affected by low support and refusal of asylum.

Strengths and limitations of this study.

x.Strengths include a longitudinal design, with first assessment within three weeks after arrival to the host country, and repeated measures.

x. Use of computer-based assessment with audio-translations throughout the study.

x.Selection of participants was limited to the most common nationality groups arriving in Norway at the time of inclusion.

x.High attrition rate due to the fact that asylum seekers tend to move between and within countries, and that many were told to leave the country.

INTRODUCTION

In 2015 more than 88 700 unaccompanied minors (UM) fled to Europe¹, putting considerable pressure on these countries to provide the necessary resources needed. Separated children that are no longer protected by parents or other caregivers, usually have to be under the age of 18 in order to be given the special protection and care that is granted unaccompanied refugee minors. In the countries of origin for UM the civil registration service of their country often function poorly, and birth certificates can be lost, thrown away or falsified.² The scientific basis for assessing age is controversial, in that these tests only determine physical maturity, and are most uncertain from the age of 15 to 21, where natural variation is at its greatest.³ The consequences for many young asylum seekers assessed to be 18 years or older is that they will no longer be considered as minors, and therefore not receive special protection in accordance with the United Nations.²

Most studies investigating UM mental health have a cross-sectional design with a selection of youths with different levels of legal recognition and different durations of time in exile.⁴

These studies show consistently that individual factors such as exposure to violence and other traumatic events prior to migration, correspond to elevated symptoms of psychological distress.⁵ In some studies the negative effects of exile related stressors are also described⁶, yet they focus on youths with varying time in exile. There are different asylum-procedures within the different countries⁷, and most UM endure some uncertainty before their legal status is defined. Most countries provide some form of shelter for UM while they are waiting for their case to be processed, but conditions vary greatly. Positive health effects have been shown to be associated with receiving a permanent residence permit⁸, but this process may take months

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3 and sometimes years. The impact of different levels of social support that UM are offered,
4 especially after the first stage of reception and registration, have not been studied in detail.⁹
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7 The aim of our study was to examine UM's mental health during the asylum-seeking process,
8 and more specifically whether the official age assessed, level of support, and the outcome of
9 the asylum application were associated with UM's mental health at different stages of the
10 asylum seeking process.
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14 15 16 17 18 19 20 21 **METHODS** 22

23 24 25 26 **Participants and procedures** 27

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32 The sample in this study was recruited from an asylum reception centre for unaccompanied
33 asylum-seeking adolescents between ages 15 and 18 years, which was the only one in Norway
34 at this time. In this reception centre, all UMs who claimed to be in this age group stayed for
35 the first weeks while asylum interviews and age-assessment procedures were performed. A
36 research assistant kept track of all new arrivals, and each time our testing capacity allowed us
37 to include some new participants, she was instructed to invite the ones who had arrived most
38 recently. The study was conducted between September 2009 and March 2011. Altogether, the
39 inclusion periods for this project were 12 weeks in 2009, 8 weeks in 2010, and 21 weeks in
40 2011. During these time periods young asylum seekers came mainly from Afghanistan and
41 Somalia. According to the statistics unit at the Norwegian Directorate of Immigration, 406
42 male UM from these language groups arrived in Norway during the inclusion periods.
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45 Unaccompanied males that had just arrived were contacted by the research assistant.

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47 Altogether, 216 adolescents were asked to participate, and 209 returned the informed consent
48 and attended the study. Some participants were included in an Expressive Arts intervention
49 group (n=71), that is not part of the present study. The remaining 138 are the focus of this
50 article. Inclusion in the intervention-group was based on a randomizing –procedure shortly
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3 after arrival in Norway. The participants in the present article were not significantly different
4 from the intervention group in any baseline characteristics ($p \geq .071$).
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7 More about the whole project can be found on our home pages¹⁰.
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10 Information to participants included statements that participation would not impact the
11 chances to stay in the country. Only one contact attempt was made for each individual, and no
12 payment was offered.
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15 Participants followed the normal procedures in the asylum process. In Norway all UMs
16 receive assistance from a multi-disciplinary professional staff (educators, social workers,
17 psychologists, physicians, and nurses) in the first reception centre while waiting for their
18 “official-age” to be assigned. Those defined as 18 or older can be moved to adult housing
19 where less professional assistance is provided. The asylum-seekers considered to be from 15
20 to 18 years are moved to specialized youth centres, with staff available 24 hours, every day.
21 The youngest children stay in even more specialized orphanages. There are some exceptions
22 to this pattern, according to variable housing capacity some 18-year old asylum-seekers are
23 allowed to stay in the youth centres for some time. The youth centres are located all over
24 Norway, and have language classes for all inhabitants. Food is prepared and served by the
25 staff, and there are staff members available day and night. Most centres have recreational
26 activities, and they give individualised support and medical follow-up if needed. In an adult
27 centre, the asylum-seekers are left to themselves most of the time. They buy and cook their
28 own food, have no school or other scheduled activities, and have no guardians or staff
29 members to ask for advice.
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41 The first screening procedure was conducted within the first three weeks, and later repeated at
42 4 months ($n=101$), 15 months ($n=84$) and 26 months ($n=69$) after arrival. At the last
43 assessment the population was almost halved, mainly because many of the informants were
44 transported out of the country, or had disappeared from the different living facilities. The
45 participants who were deported were mostly individuals who had been registered as asylum-
46 seekers in another European country before coming to Norway, or individuals suspected of
47 having some connection to illegal activities. The ones who deflected were typically those who
48 feared deportation after their asylum-applications were turned down. It was, however,
49 impossible to obtain exact numbers and reasons for the attrition in this project. When we
50 compared those who have completed all four assessments with those who missed out at one occasion
51 or more, there were no significant differences in any baseline demographic or symptom variables.
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Measures

Demographic data was registered with the aid of interpreters at the initial assessment. We asked for self-reported age, literacy, years of school attendance, and whether their parents were still alive, deceased, or if participants had lost touch with their parents and did not know. Later we registered the results of official age-assessments, especially which participants who were thought to be at least 18 years of age. We also determined the level of care offered according to placement in asylum centres for either adults or for youth. Before the last assessment we registered the legal status, as participants were either given time-limited or permanent permission to stay, or were refused legal residence in the country. New variables of interest such as level of care and legal status were included when they occurred prior to a new assessment.

Exposure

Serious Life Events checklist (SLE) was developed by Tammy Bean and colleagues¹¹ in order to assess if an adolescent meet the criteria A1 (experienced a traumatic event) in the DSM-IV, for a diagnosis of PTSD. It is a self-report questionnaire which asks whether or not the participant has experienced twelve different kinds of traumatic events, such as separation from family, natural disaster, war and physical or sexual abuse. The instrument was scored by answering yes or no on each item.

Psychological distress

Hopkins Symptom Checklist-25 (HSCL-25)¹² is a self-administered questionnaire designed to measure anxiety and depression. It has been validated in various clinical and community samples.^{13,14} The HSCL-37 A version is an extension of the HSCL-25, and has also been applied in a number of refugee studies with minors.^{15,16} The additional 12 items measuring externalizing behavior are not included in this paper. Each item was scored with 1 (not bothered) to 4 (extremely bothered). Scores ≥ 2.0 was considered probably clinically significant.¹⁷

Post Traumatic Symptom Score (PTSS)

The Harvard Trauma Questionnaire¹⁸ is a comprehensive instrument that was developed to assess potentially traumatic experiences and post-traumatic symptoms in various cultural contexts. Its psychometric properties were first established in a highly traumatized, clinical population, but it has also been evaluated with a larger community sample, and with asylum seeking adolescents^{6,19}. The HTQ part IV, comprises 30 symptom items, among which the first 16 items measure “The symptoms of PTSD” according to the DSM–IV.²⁰ These 16 items are scored with 1 (not at all) to 4 (extremely). Scores ≥ 2.0 was considered probably clinically significant.¹⁷

Computer-based assessment

The chosen psychometric measurements were combined into a single questionnaire using the program MultiCASI²¹. The questionnaires were filled in by the participants themselves, in their native languages, Dari, Pashto, Farsi or Somali, using laptops with touch-screen function. Translations had been attained from earlier projects, and were controlled by independent, native speaking, interpreters before they were added to the questionnaire. The items appeared one after the other on the screen, together with answering alternatives. All text had a sound-file connected to it that started as soon as the item appeared on the screen. The test could be used with any level of reading competence, and the sound of each item could be activated by touch, as many times as necessary. Items could be skipped and left unanswered, but would then be repeated once more towards the end of the questionnaire. The first introduction to the computer based self-screening was done shortly after arrival, with one language group at the time. An interpreter was present together with maximum five participants, as they were instructed in how to use the touch screen. They were encouraged to ask clarifying questions as they went on with answering the items, all in the same room, with earphones on, in order not to disturb each other. During the following waves of data collection the same questionnaire was used and translating services were not necessary. The results were transported digitally to the SPSS files.

Data analysis

Differences in HSCL and PTSS between 0, 4, 15 and 26 months were assessed by linear mixed effects models by categorical time, including an inter-individual random effect.

Relationships between HSCL, and PTSS at each time point ≥ 4 months and characteristics known at that time point were assessed by unadjusted and linear regression. Specifically, covariates were being literate, parents deceased, number of adverse events and age assessed as ≥ 18 years at 4 months. At 15 months, being placed in a reception center for adults or youth, was included, and at 26 months also asylum status; permanent, time limited or refusal of asylum. Due to a low number of missing values in the independent variables in the regression analyses (at most 3 missing values on any independent variable) complete case analysis was considered appropriate. Nonresponse analysis during follow up (4 to 26 months) used a generalized estimating equations (GEE) logistic regression by time and baseline HSCL score, reading ability, category for parents alive and number of serious life events. For descriptive analyses we used the SPSS version 22 for Windows. Beyond this, data was analyzed using R (The R Foundation for Statistical Computing, Vienna, Austria) with the R package nlme for mixed effects models and gee for GEE analyses²².

Table 1. Baseline characteristics of male unaccompanied refugee minors at arrival in Norway. Figures are given as number (%) when others not specified.

	N = 138
Age, self-reported (n=130)	
Mean years (SD)	16.22 (0.84)
Range	14 - 20
Age, assessed by authorities (n=132)	
Mean years(SD)	18.22 (2.27)
Range	15 - 27
Nationality	
Afghan	102 (73.9)
Somalian	32 (23.2)
Iranian	3 (2.2)
Algerian	1 (0.7)
Literacy, self-reported (n=136)	50 (36.8)

No loss of parent	30(21.7)
Loss of father	60(43.5)
Loss of mother	4(2.9)
Loss of both parents	25(18.5)
Unknown	16(11.9)
Psychological distress (n=131)	
Mean HSCL (SD)	1.94 (0.58)
Caseness (n \geq 2.0)	29 (21.0)
Posttraumatic stress (n=133)	
Mean PTSS (SD)	2.16 (0.62)
Caseness (n \geq 2.0)	81 (58.7)

Results

Three fourths of the population came from Afghanistan, while the remaining came from Somalia and Iran (table 1). There were no significant differences between the countries of origin and the variables included in this article. A minority (36%) were able to read in their own language. Mean number of serious life-time events experienced was 6.1 (SD 2.3), range 1-11. Most of the participants (96%) had experienced at least one of the serious life events listed. The most frequently reported experiences were life threatening events (82%), physical abuse (78%), and loss of a close relative (78%). The official age assessment found a mean age of 18.4 years (SD 2.4), range 15-28, which meant that 72 (56%) participants were considered to be adults. Of this “adult” group, 36 participants were allowed to stay at the care centres for adolescents, while the rest had to move to centres for adults. None of the participants received psychiatric treatment during the study. Overall there were no significant changes in the level of symptoms within the study period ($p \geq .084$), neither for HSCL (Table 2) nor for PTSS.

Table 2. Mixed effect coefficients (MEC) for time modelling the course of psychological distress (HSCL) and posttraumatic stress (PTSS) in unaccompanied refugee minors after arrival in host country.

	HSCL			PTSS		
	MEC	95% CI	P	MEC	95% CI	P
Time			.136			.725
4 mo vs 0 mo	0.04	-0.09, 0.16	.557	0.02	-0.12, 0.15	.811
15 mo vs 0 mo	0.14	0.01,0.27	.037	0.03	-0.11, 0.17	.671
26 mo vs 0 mo	-0.02	-0.16, 0.13	.831	-0.06	-0.21, 0.09	.441

HSCL : Hopkins symptom checklist

PTSS : Posttraumatic stress symptom checklist

Tables 3-5 show the associations between variables of interest, and symptoms of psychological distress at different test points. Outcome of age assessment, which was known shortly after the first assessment, had no significant association with psychological distress at 4 months (table 3). However, those who were estimated to be 18 years or older, had higher levels of symptoms at 15 months (table 4) and at 26 months (table 5), but not when adjusted for the outcome of the asylum-applications at the 26 month assessment.

Table 3. Regression coefficients for literacy, pre-migration bereavement, serious life-events and post-migration age assessment, related to course of psychological distress (HSCL) in young male asylum seekers 4 months after arrival in host country; results unadjusted and adjusted for the other variables.

	Unadjusted			Adjusted		
	Coef.	95% CI	P	Coef.	95% CI	P
Being literate	0.348	0.115,0.581	.004	0.262	0.006, 0.518	.045

Parents deceased			.245			.457
Unknown vs both alive	0.175	-0.232,0.581	.396	0.146	-0.254, 0.545	.472
One dead vs both alive	0.146	-0.166,0.457	.355	0.182	-0.119, 0.483	.234
Both dead vs both alive	-0.172	-0.564,0.219	.384	-0.053	-0.442, 0.337	
Adverse events	0.066	0.015,0.116	.012	0.046	-0.006, 0.098	.084
Age assessed ≥ 18 years	0.126	-0.118,0.370	.308	0.068	-0.191, 0.326	.604

HSCL: Hopkins symptom checklist

Table 4. Regression coefficients for literacy, pre-migration bereavement, serious life-events and post-migration age assessment, in addition to asylum-seeker facilities, related to course of psychological distress (HSCL) in young male asylum seekers 15 months after arrival in host country; results unadjusted and adjusted for the other variables.

	Unadjusted			Adjusted		
	Coef.	95% CI	P	Coef.	95% CI	P
Being literate	0.054	-0.254,0.363	.727	0.008	-0.296, 0.313	.957
Parents deceased			.134			.073
Unknown vs both alive	0.240	-0.278,0.757	.359	0.346	-0.133, 0.825	.154
One dead vs both alive	0.253	-0.141,0.646	.206	0.317	-0.051, 0.684	.090
Both dead vs both alive	0.581	0.097,1.065	.019	0.626	0.157, 1.094	.010
Adverse events	0.039	-0.030,0.107	.262	0.054	-0.010, 0.119	.099
Age assessed ≥18 years	0.522	0.238,0.805	<0.001	0.375	0.058, 0.692	.021
Adult reception center	0.464	0.136,0.792	.006	0.354	0.011, 0.695	.043

HSCL: Hopkins symptom checklist

Table 5. Regression coefficients for literacy, pre-migration bereavement, serious life-events and post-migration age assessment, asylum-seeker facilities, in addition to asylum-status, related to course of psychological distress (HSCL) in young male asylum seekers 26 months after arrival in host country; results unadjusted and adjusted for the other variables.

	Unadjusted			Adjusted		
	Coef.	95% CI	P	Coef.	95% CI	P
Being literate	0.025	-0.305,0.355	.881	-0.040	-0.322, 0.242	.777
Parents deceased			.043			.038
Unknown vs both alive	0.591	0.021,1.162	.042	0.562	0.076, 1.047	.024
One dead vs both alive	0.261	-0.130,0.652	.187	0.384	0.049, 0.719	.025
Both dead vs both alive	0.670	0.160,1.180	.011	0.532	0.088, 0.976	.020
Adverse events	-0.059	-0.126,-0.008	.083	-0.041	-0.097,0.016	.155
Age assessed ≥18 years	0.392	0.086,0.697	.013	-0.070	-0.428, 0.288	.696
Adult reception center	0.717	0.372,1.063	<.001	0.272	-0.169,0.712	.222
Asylum status (vs acceptance)			<.001			.017
Time-limited asylum	-0.035	-0.391,0.320	.844	-0.103	-0.498, 0.292	.602
Refusal of asylum	0.787	0.402,1.172	<.001	0.590	0.122, 1.059	.015

HSCL: Hopkins symptom checklist

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3 One third of the participants were placed in a reception centre for adults. Figure 1 shows the
4 trajectories of psychological distress for participants placed in a reception centre for adults or
5 for youth. Those who were placed in a reception centre for adults had higher levels of
6 psychological distress symptoms both at 15 months (table 4) and 26 months (table 5)
7 compared to the remaining participants who were placed in reception centres for youth.
8 However, when adjusted for the outcome of the asylum application at the 26 month
9 assessment, the difference was not significant.
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15 Final decision on the asylum claims was given between the last two test points. Refusal was
16 highly associated with higher levels of psychological distress. Achieving time limited
17 residence permission was not significantly different compared to permanent asylum (table 5).
18 Trajectories of psychological distress for those who received refusal or acceptance of their
19 asylum application are illustrated graphically in figure 2. Refusal was related to the official
20 determined age of the asylum seeker. Among the participants who were considered to be 18
21 or more, 52 out of 72(72.2%) were refused, compared to 15 out of 59(25.4%) among the
22 participants who were considered to be under 18 (7 missing).
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29 The symptom scores of the PTSS (not illustrated in the tables) showed a similar association as
30 the HSCL-scores, with higher levels of PTSD-symptoms for those placed in a reception center
31 for adults at 15 months (adjusted difference 0.34, 95% CI 0.06 to 0.63, $p=0.017$), as well as
32 higher symptom scores for those who received a negative result for the asylum application at
33 26 months (adjusted difference 0.60, 95% CI 0.24 to 0.95, $p=0.001$).
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39 Loss to follow-up was not significantly related to initial levels of distress. Also, none of the
40 baseline covariates were significantly related to nonresponse.
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47 **DISCUSSION**

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49 The present study is a follow-up of unaccompanied refugee minors with four waves of
50 assessment from within three weeks after arrival to more than two years spent in the host
51 country. At the group level the young asylum seekers reported high levels of psychological
52 distress on arrival, and symptom levels that stayed relatively unchanged over time. A low
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3 level of support during the asylum process and a negative outcome of the asylum application
4 were associated with higher levels of psychological distress.
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7 Determination of the legal status of the asylum seekers involved age assessment procedures,
8 with x-rays and dental examinations for all participants in this study. This resulted in a
9 considerable gap between self reported age and the official age estimates designated by the
10 immigration authorities. On the basis of these examinations 55% of the asylum seekers were
11 considered to be at least the age of 18, and thus did not achieve a UM status. They risked
12 being moved to a facility for adults, with low levels of support and care, and limited access to
13 education and leisure activities. Also, the likelihood of being granted asylum was related to
14 age, as illustrated by the numbers of children and adults in our study who got refusal of their
15 claims.
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22 The results from our study is in agreement with other studies that have found that high-
23 support housing, with sufficient supervision, was associated with lower levels of
24 psychological symptoms⁵. Others have also described problems directly connected to the
25 asylum process, and have registered them as components in a list of post-migration stressors⁹.
26 A weakness with most of these studies, are cross-sectional designs where there are no base-
27 line measurements. Only a few studies have repeated assessments⁶ where problems directly
28 connected to the asylum process, such as age-assessment procedures, lack of adequate
29 housing, low support, etc., have been evaluated. The complexity of factors contributing to the
30 increasing health risk, make it difficult to draw specific conclusions within the total burden of
31 stressors.
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40 In all studies with UM, it is likely that there will be some uncertainty concerning the
41 participants' true chronological age³. Defined to be overage, in the present study, was not
42 significantly related to the symptom scores at the 4 month assessment, and there was no
43 indication that this process was stressful in itself. The age designated by the authorities,
44 determined what type of housing and level of care that was offered during the remaining
45 asylum-procedure. This meant that many of the participants had to live in a reception centre
46 for adults, where they had no guardian, no school, had to cook for themselves, and budget
47 their benefits. Our findings that this group had higher levels of psychological distress, add
48 further evidence that living conditions in the asylum seeking period may influence the mental
49 health of young refugees.^{6,9} It was probably known in the community and among the youth
50 that being categorized as an adult increased the risk of asylum refusal. This factor is
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3 impossible to separate from the expectations associated with the placement in youth or adult
4 reception-centres. There should be a cautious interpretation of the results because of this
5 clustering of risk factors. It is also possible that the asylum interviews were more adversarial
6 for those who had adverse age assessments. These interviews happened early in the asylum-
7 trajectories, but these official age assessments may have been used to question testimonial
8 credibility in the asylum process.
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12 The outcome of the individual asylum applications was revealed to the asylum seekers
13 between one and two years after the arrival, and the negative impact of refusal was as
14 expected since several studies have found that difficulties obtaining legal residence are
15 associated with a range of psychological problems for this group⁶. We also know that
16 longitudinal studies indicate a trend towards reduction of mental health symptoms for
17 resettled refugees over time.²³ In a follow-up study of 131 young refugees in Denmark, the
18 long term effects of pre-migration adversity were mediated by a variety of factors connected
19 to social life.²⁴ Another study suggests positive health effects upon receiving permanent
20 residence mediated through improved living conditions.²⁵ This, in association with our
21 findings, emphasizes the importance of a supportive post-migration environment for all
22 refugees with pre-migratory experiences of serious trauma and human rights violations.
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32 Strengths of our study include a longitudinal design, with first assessment within three weeks
33 after arrival to the host country, and repeated measures. We used computer-based assessment
34 with the same audio-translations throughout the study, and did not need to use interpreters in
35 order to complete the psychometric measures at follow-up. Due to a random selection of
36 participants we consider the sample to be representative for the refugees arriving to Norway
37 in the first decade of the century. However, selection of participants was limited to the most
38 common nationality groups arriving in Norway in this period, and may limit the
39 generalization of our findings to refugees in general.
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46 High attrition rate due to the fact that asylum seekers tend to move between and within
47 countries, and that many were told to leave the country, may have biased our findings. It is
48 also possible that our research team was not viewed as independent from the authorities, even
49 though we stressed this fact when we informed about the project. Finally, we have no data as
50 to whether poor mental health might have affected the likelihood of asylum. Mental health is
51 generally not an issue in the processing of asylum applications in Norway. Also, the baseline
52 levels of mental health did not differ between participants that later received asylum and those
53 who did not.
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Implications

Our study shows that young asylum-seekers may spend considerable time in a safe Western country, without recovering from the distress they have when they arrive in the host country. A reason for the continuing psychological health problems in this non-clinical group of youth can possibly be found in the living conditions and the level of care that is provided.

Adolescence is a challenging transition-period for most people. Fleeing to a foreign country without parents or other caregivers makes this life-period even more challenging for young refugees, and puts a considerable responsibility on the receiving countries. The burden of increasing numbers of asylum-seekers challenges the political intentions of the UN Convention on the Rights of the Child (CRC) to always give precedence to “the best interest of the child”.²⁶ It is emphasized that safety and dignity in the use of medical assessments should be applied as a supplement to evaluations of the physical appearance and the psychological maturity of the child.

An important objection to the use of dental/bone-age assessments is their lack of precision, especially around the time of puberty. The tests have been criticized for their large margins of error, and their inadequacy in determining chronological age.³ Professionals in various countries have differed with some doctors refusing to take part in such tests, while others have argued that these assessments are the best practice available.

Needs of vulnerable adolescents and young adults in a stressful life-situation deserve high priority and should be a main focus regardless of the outcome of age assessments.²⁷ It is noteworthy that access to psychiatric care was not evident for any of the participants although a majority of this sample had symptom levels suggesting a positive diagnosis of PTSD. This may reflect a lack of resources available for this population or reluctance to ask for health care.

In our society turning 18 is usually considered a transition point from child to adult. Yet with the limitations of the age determining process we cannot know for certain that this milestone has been reached. The consequences of this uncertainty can have legal, social and material implications.²⁸ If a child is put under difficult living-conditions, where previous human support and education is withdrawn, this can have unintended negative effects on these young individuals transitioning into adulthood. Some child protection services argue that vulnerable

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3 young adults are still in need of support and care after the age of 18²⁹, and need to receive
4 specialised care into their twenties.³⁰ Future studies should focus on how mental health and
5 resilience evolve over a longer time span, and evaluate specific interventions and appropriate
6 levels of care for young refugees.
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14 **Acknowledgement:** Gratitude to Liv Berit Løken for her care and assistance with all aspects
15 of the data collection. Thanks also to our very skilled interpreters, and to all the young
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20
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22 article. Heir was, in collaboration with DeMott and Jakobsen, responsible for the literature
23 review and the conception and design of the article. DeMott and Jakobsen has been
24 responsible for all phases of the data collection. Data analysis and interpretation of data was
25 done in cooperation between Jakobsen, Heir and Wentzel-Larsen. All authors have
26 contributed to the scientific writing and proof-reading of the article. The paper has been read
27 and approved by all authors before submission.
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34

35 **Competing interests:** None
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37 **Ethics approval:** Regional Committees for Medical and Health Research Ethics.
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40 **Data sharing statement:** No additional data are available.
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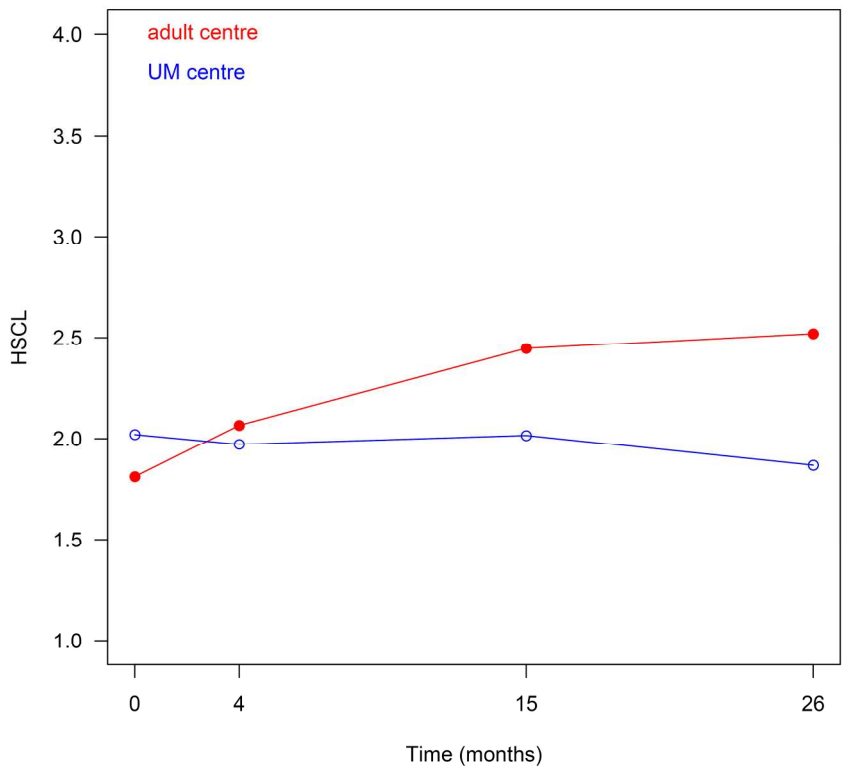
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Figure legends:

Fig 1. Course of psychological distress (HSCL) during follow up of asylum seekers placed in asylum centers for adults (n=38) and asylum seekers placed in asylum centers for youth (n=100).

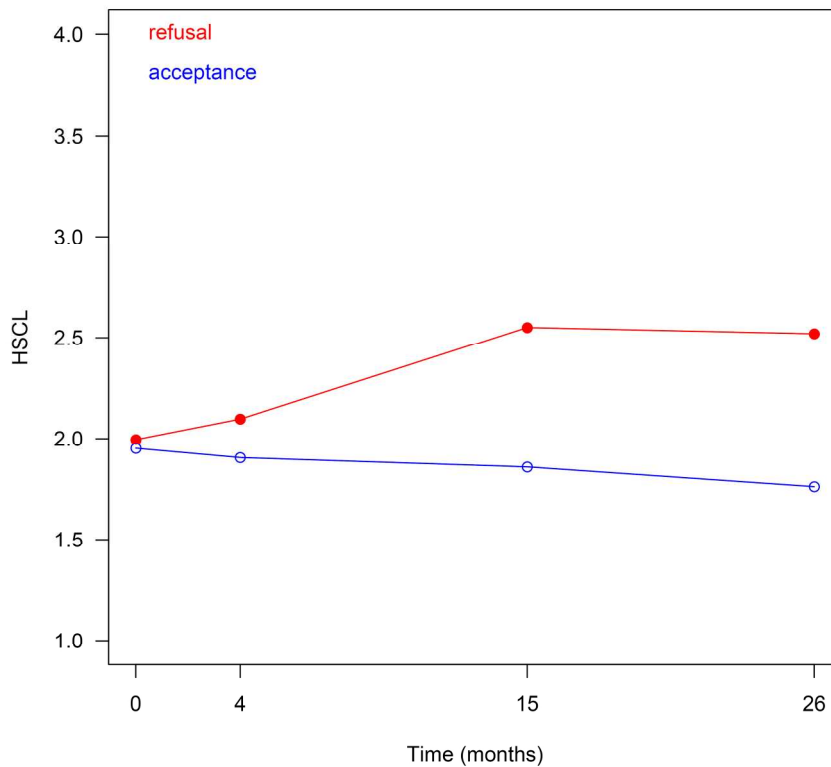
Fig 2. Course of psychological distress (HSCL) during follow up of asylum seekers who received refusal of asylum (n=67) and asylum seekers who received residence permission or time limited asylum (n=64).

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STROBE Statement—checklist of items that should be included in reports of observational studies

	Item No.	Recommendation	Page No.	Relevant text from manuscript
Title and abstract	1	(a) Indicate the study’s design with a commonly used term in the title or the abstract	<u>1</u>	Done: Longitudinal study
		(b) Provide in the abstract an informative and balanced summary of what was done and what was found	<u>2</u>	Done: see Abstract
Introduction				
Background/rationale	2	Explain the scientific background and rationale for the investigation being reported	3	Done: see introduction
Objectives	3	State specific objectives, including any prespecified hypotheses	4	Specified hypoth. not possible
Methods				
Study design	4	Present key elements of study design early in the paper	4-5	Done
Setting	5	Describe the setting, locations, and relevant dates, including periods of recruitment, exposure, follow-up, and data collection	5	Done
Participants	6	(a) <i>Cohort study</i> —Give the eligibility criteria, and the sources and methods of selection of participants. Describe methods of follow-up	4	Done: see introduction and methods
		<i>Case-control study</i> —Give the eligibility criteria, and the sources and methods of case ascertainment and control selection. Give the rationale for the choice of cases and controls		
		(b) <i>Cohort study</i> —For matched studies, give matching criteria and number of exposed and unexposed		N.a.
Variables	7	Clearly define all outcomes, exposures, predictors, potential confounders, and effect modifiers. Give diagnostic criteria, if applicable	6-7	Done: see methods (effect modifiers not included)
Data sources/ measurement	8*	For each variable of interest, give sources of data and details of methods of assessment (measurement). Describe comparability of assessment methods if there is more than one group	7	Done
Bias	9	Describe any efforts to address potential sources of bias	7-8	Done: see statistical methods
Study size	10	Explain how the study size was arrived at	4	Data collection was done in collaboration with immigration authorities. The numbers were determined by new arrivals during the periods we were allowed to be at the centre.

Continued on next page

Quantitative variables	11	Explain how quantitative variables were handled in the analyses. If applicable, describe which groupings were chosen and why	7-8	Done: see statistical methods
Statistical methods	12	(a) Describe all statistical methods, including those used to control for confounding	7-8	Done
		(b) Describe any methods used to examine subgroups and interactions	7-8	Done
		(c) Explain how missing data were addressed	7-8	Done.
		(d) <i>Cohort study</i> —If applicable, explain how loss to follow-up was addressed <i>Case-control study</i> —If applicable, explain how matching of cases and controls was addressed <i>Cross-sectional study</i> —If applicable, describe analytical methods taking account of sampling strategy		N.a.
		(e) Describe any sensitivity analyses		N.a.
Results				
Participants	13*	(a) Report numbers of individuals at each stage of study—eg numbers potentially eligible, examined for eligibility, confirmed eligible, included in the study, completing follow-up, and analysed	4	Done: see methods
		(b) Give reasons for non-participation at each stage	5	Uncertain
		(c) Consider use of a flow diagram		N.a.
Descriptive data	14*	(a) Give characteristics of study participants (eg demographic, clinical, social) and information on exposures and potential confounders	8-9	Done: see results and table 1
		(b) Indicate number of participants with missing data for each variable of interest		N.a.
		(c) <i>Cohort study</i> —Summarise follow-up time (eg, average and total amount)	5	Done: see methods
Outcome data	15*	<i>Cohort study</i> —Report numbers of outcome events or summary measures over time		Done: see tables 2-5
		<i>Case-control study</i> —Report numbers in each exposure category, or summary measures of exposure		<u>N.a.</u>
		<i>Cross-sectional study</i> —Report numbers of outcome events or summary measures		<u>N.a.</u>
Main results	16	(a) Give unadjusted estimates and, if applicable, confounder-adjusted estimates and their precision (eg, 95% confidence interval). Make clear which confounders were adjusted for and why they were included	10-13	Done
		(b) Report category boundaries when continuous variables were categorized	6-7	Done: see table 1 and measures
		(c) If relevant, consider translating estimates of relative risk into absolute risk for a meaningful time period		N.a.

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Other analyses	17	Report other analyses done—eg analyses of subgroups and interactions, and sensitivity analyses		N.a.
Discussion				
Key results	18	Summarise key results with reference to study objectives	9	Done
Limitations	19	Discuss limitations of the study, taking into account sources of potential bias or imprecision. Discuss both direction and magnitude of any potential bias	15-16	Done
Interpretation	20	Give a cautious overall interpretation of results considering objectives, limitations, multiplicity of analyses, results from similar studies, and other relevant evidence	15-17	Done
Generalisability	21	Discuss the generalisability (external validity) of the study results	16	Done
Other information				
Funding	22	Give the source of funding and the role of the funders for the present study and, if applicable, for the original study on which the present article is based	18	Done.

*Give information separately for cases and controls in case-control studies and, if applicable, for exposed and unexposed groups in cohort and cross-sectional studies.

Note: An Explanation and Elaboration article discusses each checklist item and gives methodological background and published examples of transparent reporting. The STROBE checklist is best used in conjunction with this article (freely available on the Web sites of PLoS Medicine at <http://www.plosmedicine.org/>, Annals of Internal Medicine at <http://www.annals.org/>, and Epidemiology at <http://www.epidem.com/>). Information on the STROBE Initiative is available at www.strobe-statement.org.