

ORIGINAL ARTICLE

## A case–control study of self-reported health, quality-of-life and general functioning among recent immigrants and age- and sex-matched Swedish-born controls

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### Abstract

**Aim:** To examine whether new immigrants had inferior quality-of-life, well-being and general functioning compared with Swedish age- and sex-matched controls. **Methods:** A prospective case–control study was designed including immigrants from non-European countries, 18–65 years of age, with recent Permanent Permits to Stay (PPS) in Sweden, and age- and sex-matched Swedish-born (SB) persons from the general population in Västmanland County, Sweden. The General Health Questionnaire (GHQ-12), the brief version of the World Health Organization Quality-of-Life (WHOQOL-BREF) Scale and the General Activity Functioning Assessment Scale (GAF) from DSM-IV were posted (SB), or applied in personal interviews (PPS) with interpreters. Differences between the PPS and SB groups were measured using McNemar's test and Wilcoxon signed-rank test conducted separately for observations at baseline, 6- and 12-month follow-up. **Results:** There were 93 pairs (mean age 36 years). Persons from Somalia (67%) and Iraq (27%) dominated the PPS group. The differences between the groups were statistically significant for all time points for the Psychological health and Social relationship domains of WHOQOL-BREF, and for the baseline and 6-month follow-up time points of GHQ-12 where the PPS-group had a higher degree of well-being, health and quality-of-life than the SB. This tendency applied for both sexes in the immigrant group. **Conclusions:** These new immigrants did not have inferior physical or psychological health, quality-of-life, well-being or social functioning compared with their age- and sex-matched Swedish born pairs during a 1-year follow-up. Thus, there is reason to advocate immigrants' fast integration into society.

**Key Words:** Immigrant, asylum, self-rated health, level of functioning, ethnicity, immigrant status, case–control study, Sweden, Quality-of-Life

### Background

Quality-of-life (QoL) is defined as individuals' perceptions of their position in life in the context of the culture and value systems in which they live in relation to their life goals, expectations, standards and concerns [1]. Self-rated physical, mental and social well-being are important predictors for morbidity and mortality, and QoL research is mostly carried out with questionnaires that are established for worldwide use, and validity tested in multicultural

settings and among many ethnic minorities. In Sweden, well-being and QoL have been investigated among established immigrant groups but not among recently arrived immigrants [2,3]. Very little is known about their global functioning compared with the indigenous Swedish population or with that of more established immigrants.

Studies of QoL are valuable with regard to public health, preventive care and organization of health

care. Immigrants as a group, and particularly recently arrived female immigrants with little education, seem to be at risk for mental ill health that is supposed to be caused by a mix of pre- and post-migration stress from acculturation as well as familial, financial and accommodation strains, pain or physical illnesses [4,5].

### **Aims**

The aims of this paper were to compare self-rated health, well-being and general functioning, at baseline and at follow-ups over 1 year, among immigrants with recent Permanent Permits to Stay (PPS) in Sweden (in Swedish: *permanent uppehållstillstånd, PUT*) in comparison with Swedish-born age- and sex-matched controls (SB).

We hypothesized that the PPS group would have significantly inferior health, well-being and social functioning than the SB group at baseline and that this difference in favour of the SB group would be more evident during the following year.

### **Methods**

This investigation was designed as a prospective case-control study with a minimum of 100 individuals in the PPS group and 100 age- and sex-matched individuals in the SB group. Information was collected using questionnaires either in face-to-face interviews (PPS) or as mailed questionnaires (SB) at three time points during a period of 1 year: at baseline, 6- and 12-month follow-up.

The PPS group consisted of individuals from countries outside the European Union, aged 18–65 years, who were registered at the Asylum and Integration Health Care Centre Västerås (AIH) and had been granted PPS in Sweden within the previous 3 months. Individuals with severe psychiatric disorders were excluded from the study.

The catchment area of the AIH covers nearly the whole county of Västmanland, Sweden, and is located about 120 km north-west of Stockholm. Recruitment was carried out in consecutive order by letters of invitation in Swedish, Arabic and Somali containing brief information about the study. Names and addresses were retrieved from the AIH after they had received information from the Integration Section of the Swedish Migration Board (*Migrationsverket*). Recruitment started in 2010 and continued for 18 months because of a high number of drop-outs and return-to-sender letters. Up to three reminder letters were sent when needed. In addition, a brief presentation of the study was made by the study nurse (HB) at the local introduction programme for PPS persons.

There were a total of 138 eligible PPS persons in the target group and 104 of them (75% participation rate) were interviewed at baseline.

The control group (SB) consisted of age- and sex-matched SBs from the general population living in the county of Västmanland. A total of 229 SB persons were sent an invitation letter; 101 of these (response rate 45%) agreed to participate, and 98 returned the first questionnaire (42% participation rate).

At baseline there were 93 matched pairs of PPS and SB individuals with data for analysis, 52 men and 41 women. In 27 pairs (14 pairs of men; 13 pairs of women), one or both of the SB and PPS persons did not participate at the 12-month follow-up. The final participation rate over the whole study period was thus 66 pairs (71% of those who participated at the start).

One eligible PPS person had a severe mental disorder and was excluded. Iraqi people were easier to recruit than Somali people, probably because they were less mobile than the many illiterate Somali people (15%). The median stay in Sweden before receiving a PPS was 9.5 months for Somali people (range = 1–28 months, less for women than for men) and 14 months for Middle-East countries (Iraq and Syria) (range = 3–22 months). There were no significant differences in characteristics between the drop-outs and the remaining pairs. The drop-out persons from the PPS group were 26–40 years of age and had often moved on to unknown addresses and changed their telephone numbers. They were not able to be located or to be sent reminders.

### *Data collection*

The screening questionnaires were posted (SB) or applied in a personal interview (PPS) by the study nurse and third author (HB) according to the instructions (see below). Interviews were performed at the healthcare centre using the same experienced professional interpreters. The interviewer used simplified Swedish to ensure accuracy in translation. The wording of questions had been discussed previously with all the interpreters. Socio-demographic data were self-reported in interviews (PPS) or in questionnaires (SB).

Interviews with the PPS persons were semi-structured and performed according to the instructions for the General Health Questionnaire (GHQ-12), the brief version of the WHO Quality of Life Scale (WHOQOL-BREF) and the General Activity Functioning Assessment Scale (GAF) from axis V of the Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition (DSM-IV).

The self-administered GHQ-12 questionnaire (Likert scale with scale steps 0, 1, 2, 3, and range

0–36) is used for identifying minor psychiatric ill-being in the general population [6]. Higher figures indicate a risk for mental ill health or inferior well-being with a proposed cut-off point of  $\geq 3$  in the dichotomous 0–0–1–1 version [7,8]. It focuses on the respondent's current state and is thus sensitive to short-term psychiatric disorders.

Variables relating to the four domains of physical and psychological health, social relations and environment were estimated using the WHOQOL-BREF's 26-item Swedish version (unpublished data) (scale steps 1, 2, 3, 4, 5 positively scaled [9]). The instrument was developed by the World Health Organization for cross-cultural use and should be self-administered if respondents have sufficient ability. Otherwise, it should be interviewer assisted or interview administered, and standardized instructions should be read out to respondents, as was done here in the PPS group.

Assessments on the GAF are rated using reference points of 0 = persistent inability to maintain minimal personal hygiene, up to 100 = good functioning in social, familial and personal areas, as formulated in axis V of the DSM-IV-TR. Earlier versions of axis V (i.e., DSM-III-R) are valid and reliable [10], and have been used in interpreted consultations [4]. Here, the GAF scale was based on interviews for the PPS group but estimated from the questionnaires by the study nurse for the SB group.

### *Ethics*

The regional ethics committee at Uppsala University approved the study (D-nr 2008/377). The PPS persons were reimbursed for their bus fares. Health services were free of charge. Support for persons with mental or physical illness or distress was available after the personal interviews.

For descriptive purposes, frequencies and percentages,  $n$  (%), were used for categorical data, and means and standard deviations (SD) were used for ordinal, discrete and continuous data. Tests of differences between the PPS and SB groups were conducted using McNemar's test for categorical data and the Wilcoxon signed-rank test for ordinal, discrete and continuous data. For the WHOQOL-BREF, GHQ-12 and GAF instruments, the tests were conducted separately for observations measured at baseline and the 6- and 12-months follow-ups. For all statistical tests, a two-sided  $p$ -value of  $< 0.05$  was considered statistically significant. All statistical analyses were performed using IBM SPSS Statistics 20.

## **Results**

### *Characteristics of the pairs*

As shown in Table I, the 52 pairs of men and 44 pairs of women had mean ages of 35 and 37 years, respectively. Persons from Somalia (67%) Middle-East: Iraq (27%) and Syria (6%) constituted the majority of the PPS group. The remaining individuals were from Iraq (27%) Syria (6%).

All SB persons had at least primary schooling, compared with 44% of PPS men and 26% of PPS women. Half of the SB persons had attended university compared with 14% of PPS persons. All SB persons had their own housing, whereas 58% in the PPS group were in temporary accommodation. One-quarter of SB persons (26%) were single compared with 15% of PPS. Nearly half (46%) of the SB persons and just over half (56%) of the PPS persons had no children. About one-third in each group had two or more children.

### *Measurements at baseline, 6- and 12-month follow-up by sex*

Tests of differences between the PPS and SB groups for the WHOQOL-BREF, GAF and GHQ-12 instruments measured at baseline, 6- and 12-month follow-up, respectively, are given in Table II, separately for men and women. For both men and women, the general tendency was both for self-reported health and well-being, as well as social, familial and personal functioning, to be higher in the PPS group than in the SB group at all three time points. This tendency was especially strong for men in the Social relationship domain of the WHOQOL-BREF instrument, with the difference being statistically significant at all three time points ( $p = 0.002$ ,  $< 0.001$  and  $0.001$  at baseline, 6- and 12-month follow-up, respectively). Of the other measures, however, the difference among men was only statistically significant for the Psychological health domain of the WHOQOL-BREF instrument at baseline ( $p = 0.020$ ) and the GHQ-12 instrument at baseline ( $p = 0.008$ ). For women, the only statistically significant difference was for the Social relationship domain of the WHOQOL-BREF instrument at baseline ( $p = 0.030$ ).

### *Tests of differences between the PPS and SB groups at baseline, 6- and 12-month follow-up without separating men and women*

Table III shows the results of tests of differences between the PPS and SB groups for the WHOQOL-BREF, GAF and GHQ-12 instruments measured at

Table I. Descriptive data by sex of the whole groups of Swedish-born (SB) and immigrants with recent Permanent Permits to Stay (PPS) in Sweden. Frequency and percentages (n, %) for categorical data, mean and standard deviation (SD) for continuous data. *P*-values (*p*) from McNemar's test.

N	Men		<i>p</i>	Women		<i>p</i>	Total		<i>p</i>
	SB	PPS		SB	PPS		SB	PPS	
	52	52		41	41		93	93	
Age, mean (SD)	35.8 (9.14)			36.8 (9.51)			36.2 (9.27)		
Country, n (%)									
Middle East	–	16 (30.8)		–	16 (36.4)		–	32 (33.3)	
Somalia	–	36 (69.2)		–	28 (63.6)		–	64 (66.7)	
Education <sup>a</sup>			<b>&lt;0.001</b>			<b>&lt;0.001</b>			<b>&lt;0.001</b>
> 9 years	51(100)	22 (44.0)		43 (100)	11 (26.2)		94 (100)	33 (35.9)	
≤ 9 years		28 (56.0)		–	31(73.8) <sup>b</sup>			59 (64.1)	
University <sup>b</sup>	25 (49.0)	7 (13.5)	<b>&lt;0.001</b>	21 (48.8)	7 (15.9)	<b>0.002</b>	46 (48.9)	14 (14.6)	<b>&lt;0.001</b>
Marital status									
Married	37 (72.5)	42 (80.8)	0.225	32 (76.2)	39 (88.6)	0.166	69(74.2)	81 (84.4)	0.086
Single	14 (27.5)	10 (19.2)		10 (23.8)	5 (11.4)		24 25.8)	15 (15.6)	
Accommodation	27 (52.9)		<b>&lt;0.001</b>			<b>&lt;0.001</b>			<b>0.004</b>
Apartment	24 (47.1)	21(40.4)		20 (47.6)	16 (36.4)		47(50.5)	37 (38.5)	
Villa		1 (1.9)		22 (52.4)	2(4.5)		46(49.5)	3 (3.1)	
Temporary accommodation	–	30 (57.7)		–	26 (59.1)		–	56 (58.3)	
Children (n)			0.154			0.854			0.226
0	31(59.6)	40(76.9)		17(38,6)	20(45.5)		48 (50.0)	60 (62.5)	
1	9 (17.3)	2 (3.8)		9 (20.5)	4 (9.1)		18 (18.8)	6 (6.3)	
≥ 2	12 (23.1)	10 (19.2)		18 (40.9)	20 (45.5)		30(31.3)	30 (31.3)	

<sup>a</sup>Missing data SB *n* = 16 and PPS *n* = 20.

<sup>b</sup>University courses included non-validated data in PPS group.

baseline, 6- and 12-month follow-up, respectively, without separating men and women. Taken together, thus resulting in a higher power, the differences between the PPS and SB groups are statistically significant for all three time points for the Psychological health and Social relationship domains of the WHOQOL-BREF, as well as for the baseline and 6-month follow-up time points of the GHQ-12 instrument. For all these statistically significant differences, the PPS group had a higher degree of well-being, health and QoL than the SB group.

It should be noted that only five PPS persons had Likert-scale ratings ≥18 on GHQ-12 (range 19–28), an indication of mental distress, compared with 15 SB persons (range 18–27).

## Discussion

The main finding in this prospective observational case-control study was that the self-ratings of the PPS persons' physical and psychological health, social relations, environmental experience and social functioning were not inferior to those of age- and sex-matched SB persons. Instead, the SB persons' self-ratings of their psychological health and social relations were significantly lower than those of PPS persons. Thus, our hypotheses were rejected.

To our knowledge, this is the first case-control study that has compared the physical and mental health of recently arrived immigrants with that of age and sex-matched native persons. In the majority of previous studies in Sweden, a comparison between immigrants with the background population has been based on posted surveys of life conditions[2]. In the present study we used a total population sample of recent immigrants and random sex- and age- matched Swedish born persons. This study design, including also healthy refugees, might explain the positive results for mental stability and personal life satisfaction among the PPS persons. However, the study used a rather short follow-up time and results may change over time. Our results contradict many other studies. This could be the result of the good environmental factors in Västmanland County, which might differ from those in the bigger cities in Sweden where immigrant populations often live under crowded conditions—settings in which many other studies have been conducted.

During the study period, the target population mainly consisted of two groups, Somali people and Iraqi people, and our study population composition reflected this. A majority of the Somali people had a low educational level, particularly the women,

Table II. Test of differences between PPS and SB for WHOQOL-BREF, GAF and GHQ at baseline, 6- and 12-month follow-up for men and women separately. Significant values in bold.

Sex	Variable	Time	PPS	SB	<i>p</i> <sup>a</sup>
			Mean (SD)	Mean (SD)	
<b>Men</b>	WHOQOL-BREF 0–100 Physical health	Baseline <i>n</i> = 51	75.5 (14.7)	75.1 (7.9)	0.473
		6 months <i>n</i> = 41	79.6 (15.9)	76.7 (8.1)	0.119
		12 months <i>n</i> = 38	76.5 (20.2)	74.4 (8.2)	0.223
	Psychological health	Baseline <i>n</i> = 51	77.2 (13.5)	69.0 (14.5)	<b>0.020</b>
		6 months <i>n</i> = 40	75.9 (20.0)	70.9 (15.8)	0.102
		12 months <i>n</i> = 38	75.3 (17.6)	72.0 (13.9)	0.191
	Social relations	Baseline <i>n</i> = 49	76.5 (16.3)	64.1 (16.3)	<b>0.002</b>
		6 months <i>n</i> = 39	80.1 (12.9)	66.0 (17.8)	< <b>0.001</b>
		12 months <i>n</i> = 38	76.1 (15.4)	62.3 (17.3)	<b>0.001</b>
	Environment	Baseline <i>n</i> = 52	67.4 (12.3)	66.4 (8.3)	0.887
		6 months <i>n</i> = 40	68.6 (12.7)	66.6 (9.6)	0.346
		12 months <i>n</i> = 38	70.4 (13.3)	67.9 (9.5)	0.302
	GAF 0–100	Baseline <i>n</i> = 52	79.6 (5.4)	78.1 (5.5)	0.186
		6 months <i>n</i> = 41	78.6 (6.9)	78.3 (6.1)	0.616
		12 months <i>n</i> = 38	77.6 (6.2)	79.5 (4.6)	0.231
	GHQ-12 0–36	Baseline <i>n</i> = 51	7.8 (4.8)	10.3 (5.2)	<b>0.008</b>
		6 months <i>n</i> = 39	9.4 (7.5)	10.2 (5.2)	0.114
		12 months <i>n</i> = 38	8.7 (5.9)	9.2 (4.2)	0.450
Women	WHOQOL-BREF 0–100 Physical health	Baseline <i>n</i> = 42	69.6 (15.3)	69.8 (13.7)	0.898
		6 months <i>n</i> = 32	70.3 (14.2)	68.6 (15.6)	0.753
		12 months <i>n</i> = 28	73.7 (14.0)	68.0 (14.7)	0.205
	Psychological health	Baseline <i>n</i> = 41	71.6 (13.2)	65.9 (16.6)	0.085
		6 months <i>n</i> = 32	69.8 (16.2)	63.9 (12.7)	0.162
		12 months <i>n</i> = 28	72.0 (16.9)	65.7 (13.5)	0.114
	Social relations	Baseline <i>n</i> = 38	75.0 (13.3)	70.4 (21.0)	0.403
		6 months <i>n</i> = 31	75.3 (15.1)	65.3 (16.5)	<b>0.030</b>
		12 months <i>n</i> = 25	75.7 (14.0)	68.3 (20.3)	0.240
	Environment	Baseline <i>n</i> = 41	68.1 (9.1)	68.2 (11.1)	0.677
		6 months <i>n</i> = 32	69.3 (9.2)	66.5 (10.0)	0.363
		12 months <i>n</i> = 28	70.8 (11.9)	67.4 (9.1)	0.290
	GAF 0–100	Baseline <i>n</i> = 41	78.8 (5.0)	77.7 (5.4)	0.432
		6 months <i>n</i> = 32	76.6 (5.0)	77.8 (5.5)	0.236
		12 months <i>n</i> = 28	75.7 (6.8)	77.3 (4.8)	0.402
	GHQ-12 0–36	Baseline <i>n</i> = 40	9.0 (4.9)	11.4 (6.0)	0.126
		6 months <i>n</i> = 30	9.8 (5.2)	12.5 (7.7)	0.112
		12 months <i>n</i> = 28	9.6 (5.7)	10.3 (5.3)	0.674

<sup>a</sup>*p* value for test of difference between PPS and SB, Wilcoxon signed-rank test.

whereas the Iraqi men in particular were well educated and had work experience and thus might have had high expectations of a new life. According to the research interviewer (HB), they tended to express a fatalistic life belief ('Inshallah') more often than the Iraqi people, something to be considered when interpreting our results.

Interestingly, only a few of the PPS persons reported sleeping problems and none reported nightmares despite a family in dispersion, resettlement concerns [5] and, although not a major concern, a home country at civil war.

A case-control study is a type of observational study in which two existing groups that are assumed

to differ in outcome are identified and compared on the basis of some supposed causal attribute, in this case immigration, to identify factors likely to contribute to a medical condition. Designing a study to compare subjects with that condition (the 'cases') and without that condition (the 'controls') requires fewer resources but yields more evidence of causal inference. This design is frequently contrasted with cohort studies in which exposed and unexposed subjects are observed until a defined outcome. We found a case-control design the most useful method in this particular case for answering the research questions of mental and physical health among newly arrived immigrants and their native counterparts.

Table III. Test of differences between remaining pairs of participants in the PPS and SB groups on WHOQOL-BREF, GAF and GHQ at baseline, and at 6- and 12-month follow-up.

Variable	Time n	PPS	SB <sup>a</sup>	<i>p</i> <sup>b</sup>
		Mean (SD)	Mean (SD)	
<b>WHOQOL-BREF 0–100</b>				
<i>Physical</i>	Baseline <i>n</i> = 93	72.8 (15.2)	72.7 (11.2)	0.606
	6 months <i>n</i> = 73	75.5 (15.8)	73.1 (12.6)	0.193
	12 months <i>n</i> = 66	75.3 (17.8)	71.7 (11.8)	0.082
<i>Mental</i>	Baseline <i>n</i> = 92	74.7 (13.6)	67.6 (15.5)	<b>0.004</b>
	6 months <i>n</i> = 72	73.2 (18.5)	67.8 (14.8)	<b>0.025</b>
	12 months <i>n</i> = 66	73.9 (17.2)	69.3 (13.9)	<b>0.041</b>
<i>Social</i>	Baseline <i>n</i> = 87	75.9 (15.0)	66.9 (18.7)	<b>0.002</b>
	6 months <i>n</i> = 70	78.0 (14.0)	65.7 (17.1)	<b>&lt;0.001</b>
	12 months <i>n</i> = 63	75.9 (14.7)	64.7 (18.6)	<b>0.001</b>
<i>Environment</i>	Baseline <i>n</i> = 93	67.7 (10.9)	67.2 (9.6)	0.926
	6 months <i>n</i> = 72	69.0 (11.2)	66.5 (9.7)	0.183
	12 months <i>n</i> = 66	70.5 (12.6)	67.7 (9.3)	0.132
GAF 0–100	Baseline <i>n</i> = 93	79.2 (5.2)	77.9 (5.4)	0.117
	6 months <i>n</i> = 73	77.7 (6.2)	78.1 (5.8)	0.777
	12 months <i>n</i> = 66	76.8 (6.5)	78.6 (4.8)	0.135
GHQ-12 0–36	Baseline <i>n</i> = 91	8.3 (4.8)	10.8 (5.6)	<b>0.003</b>
	6 months <i>n</i> = 69	9.6 (6.5)	11.2 (6.4)	<b>0.032</b>
	12 months <i>n</i> = 66	9.1 (5.8)	9.7 (4.7)	0.423

<sup>a</sup>Questionnaire ratings by estimates from personal interviews in the PPS group vs. self-ratings in the posted questionnaires among the matched pairs of Swedes (SB).

<sup>b</sup>*p* value for test of difference between PPS and SB, Wilcoxon signed-rank test.

Trends over time indicate that the questionnaires used here were reliable. For the SB persons, the results on health and general functioning as measured by the GAF might depend on factors not targeted here, such as that the ratings were achieved differently in the target and the control groups. However, content validity and interpretation of meanings might have differed between the native and immigrant groups. This could be a target aim for further investigation (e.g. a qualitative study).

A GHQ-12 score of ≥3 in the dichotomized scale using 0–0 (1 and 2) and 1–1 (scores 2 and 3) indicates a psychological disorder; 25% of the SB persons and 20% of the PPS persons fell into this category. This implies a healthy migration pattern, or that the persons in the PPS group had lower expectations of QoL than the SB controls. In comparison, Taloyan *et al.* found that 11% of Swedish born persons vs. 26% of the Kurdish-born had poor psychological well-being measured with the GHQ-12 (0–1) from the national survey data collected in 1996 [3]. However, in the present study, only two PPS individuals scored above the cut-off limit on the GHQ-12 Likert scale. Thus, a dichotomized GHQ-12 scale may overestimate the prevalence of mental illness. The validity of the GHQ scale has also been questioned [11], but it is often used in Swedish national surveys of general well-being [2,12]. Here, some questions had to be reformulated to allow comprehension by the PPS persons, and where possible, they were dichotomized

into yes or no alternatives. There were no comments on this from the SB persons.

The GAF scale is a part of the DSM (axis V) and has been shown to be valid and reliable [13] in interpreted consultations in multicultural settings [4,14]. Axis V in later DSM versions has other labels, but in main the same content.

#### *Comparison with other studies*

Chronic diseases, such as diabetes, seem to cause greater suffering among immigrants than the indigenous Nordic population [15,16]. The worst-off seem to be refugee men in Sweden who had higher pre-term death rates than other immigrants, who, in turn, had a slightly greater risk of dying of cardiovascular or external causes [17]. This could in part be caused by mental ill health, which among Middle East persons with recent permits to stay has been found to be linked mainly (62% of the variance) to post-migration stress (i.e. social or financial strains, status loss and violence), while pre-migration stress accounted for the remainder [18]. In contrast, refugee women from low-income countries seem to be at special risk for mental ill health, meaning that clinicians should focus on pre-migration stress and the asylum process [19]. Similarly, Bosnian refugee women who had lived for 3–4 years in Sweden were found to have a very high risk of mental distress [20].

Musculoskeletal pain can be another risk factor for depression. It is found among younger well-established immigrants, but is less pronounced among those with intermediate education [21]. Likewise, depressive symptoms were found to be more common among immigrant women in Canada, as well as among people with low levels of education, while mental distress was less common among immigrants with an intermediate length of stay [22]. Such mental distress patterns might reflect various post-migration stress factors, including the mental process of cultural changes [5].

Quality-of-life scores on the WHOQOL scale were particularly low for the 55 refugee patients at a psychiatric outpatient clinic in Norway [23], and QoL as a result of adaptation stress was also low among non-recent immigrant Kurdish men in a population study [24].

Severe anxiety and depression are often found to be related to exposure to refugee traumas [25]. There are, however, limited possibilities for refugees to participate in trauma treatments because of language barriers and the attitudes among treating doctors [26]. Furthermore, the use of khat, an amphetamine-like stimulant, may partially explain psychotic behaviour in a large number of young psychotic Somali men [27]. In the present study, khat misuse was not an overt problem, but again, questions concerning illegal drugs could overtly or covertly have been embarrassing to ask or answer. However, severe mental disorders were very uncommon here, which is surprising as psychotic disorders tend to be common among second-generation refugees [28], but some refugees in general practice seem to lack understanding regarding the differences between psychological problems and physical symptoms [26]. Some authors recommend mental health screening during refugee reception, which might assist in identifying subjects with trauma-related healthcare needs [29]. For refugees at risk, a good settlement service during the first year might improve their mental and physical health [30].

### Limitations of the study

The study has a number of limitations and, therefore, results should be interpreted with caution. First, recruitment of persons in the SB group was problematic with less than 50% of the first polled SB persons agreeing to participate in the survey. This may bring into question the generalizability of the study results because of possible selection bias. Our sex- and age-matched Swedish-born participants were younger than the general population and younger persons tend to report worse mental well-being [12]. Also, a

major proportion of the SB drop-outs might have been in better health and thus, according to experience, have been less inclined to answer postal questionnaires. To compare, a recently performed population-based survey in the county of Västmanland also had a participation rate of about 50% in the same age group, and their QoL, measured with GHQ, was of similar magnitude to that in the present investigation [12].

Second, we used a rather short follow-up time of 1 year to observe changes in QoL. However, despite the follow-up period being short, it showed that migration and adaptation stress had already diminished at the time of receiving the PPS. Third, many refugees were reluctant to participate at the start and asked whether it would be beneficial for them to participate. Another limitation was that some PPS persons, in particular Somali people, did not readily comprehend the personal questions about body and sex life. They perceived such questions to be related to a general life satisfaction and Allah's will, a view of life that could be considered a stabilizing factor regarding mental well-being. In addition, feelings of relief and security in having received the PPS had likely improved their life quality in comparison with pre-migration life. Recruitment of PPS persons was hampered by their insecure accommodation conditions. Thus, this case-control study design caused a loss of available data from the matched pairs. Interestingly, their second-hand accommodation conditions did not appear to have any serious impact on their ratings of environment.

Here, the PPS population consisted of many poor, illiterate Somali people with little work experience, which might limit the transferability of the results.

Another cause of concern is the different methods of data collection using interpreted semi-structured interviews because of high rates of illiteracy in the PPS group, whereas limited time and research resources forced collection of clean self-reported data by questionnaires in the reference group. However, this method is used in the 'Liv and Hälsa', a bi-annual study in the five Mälare Valley counties (except Stockholm) with similar questionnaires, allowing us to compare our data with those from a larger population.

The interviews were conducted by a nurse using an interpreter, and therefore the filtered answers might have been biased in one way or another by personal or translation matters and also as in the meaning of the words.

There were several strengths of the data collection: the interpreters were few in number, they were experienced and well prepared and the study nurse

herself interviewed all PPS persons, as recommended by the WHO. Personal interviews are also advocated in multicultural study settings by other authors when performing, instead of applying, self-rating questionnaires among semi-literate and illiterate people [16]. However, interviewees might distrust professional interpreters and thus distort or falsify their answers, especially regarding personal matters.

A further strength is the prospective design of the study with a target group and a matched control group of SB people, with the latter group including persons who were well established and comparable in both socio-economic aspects and with regard to self-rated GHQ scores for the general population of the county [12]. This strengthens the finding that our PPS persons had stable ratings compared with the SB persons, and even superior ratings with regard to social relations.

Hence, despite the limitations, we consider our results to be valid for the initial resettlement period, and suggest that it should be possible to transfer them at least to other Nordic countries. Regrettably, the follow-up period was rather short and drop-out rate was high, and therefore these results should be validated in future studies with longer follow-up periods and with higher numbers of different study populations. In main our data are of more interest over time than between groups, as they cannot be compared because of different living circumstances.

#### *Clinical implications*

In clinical situations, we treat individuals, not groups, and this should be kept in mind when these results are applied to real life. General screening in unselected settings of refugees and new immigrants seems to be of little value, however. Clinical consultations in selected cases are to be preferred, adopting a holistic practical approach in patient and family-focused care without presumptions or prejudices.

#### **Conclusions**

Our hypotheses were not supported as these PPS men and women did not rate as inferior their physical or psychological health or QoL compared with their age- and sex-matched SB pairs during the 1-year follow-up. Based on the present study, we postulate immigrants' fast integration into society because there is no indication of inferior health compared with the native population. Fewer general health surveys among recently arrived immigrants also may be advisable, with health care concentrated more on those at risk. Furthermore, studies with other designs are warranted, including other research questions to

confirm or reject the results presented here on general health screening of refugee populations.

#### **Conflict of interest**

The authors declare that there is no conflict of interest.

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