

Ethnic differences in functional limitations: a comparison of older migrants and native Dutch older population

Fatima El Fakiri¹, Jessica Bouwman-Notenboom², Charles Agyemang³

1 Department of Epidemiology, Health Promotion and Care Innovation, Public Health Service of Amsterdam, Amsterdam, The Netherlands

2 Department of Public Health, Municipality of Utrecht, Utrecht, The Netherlands

3 Department of Public & Occupation Health, Amsterdam University Medical Centres, University of Amsterdam, Amsterdam Public Health Research Institute, Amsterdam, The Netherlands

Correspondence: Fatima El Fakiri, Department of Epidemiology, Health Promotion and Care Innovation, Public Health Service of Amsterdam, P.O. Box 2200, 1000 CE Amsterdam, The Netherlands, Tel: +31 20 555 54 95, e-mail: fefakiri@ggd.amsterdam.nl

Background: Although the older migrants population in Europe is expected to grow substantially in the coming years, there is little information about their health status and particularly functional limitations. This study examined the association of ethnicity and mobility, hearing and visual limitations in comparison to the general population in the Netherlands, and whether relevant characteristics explained the potential differences between older migrants and non-migrants. **Methods:** Secondary data analysis of 12 652 subjects 55 years and older who participated in the health survey in the four largest Dutch cities. To establish limitations in vision, hearing and mobility, the Organization for Economic Co-operation and Development (OECD) questionnaire was used. Logistic regression analysis was used to examine the association between limitations and ethnic background, subsequently adjusting for demographic and socio-economic characteristics and relevant health- and lifestyle-related factors. **Results:** Older migrants had higher prevalences of functional limitations. The age- and gender adjusted ORs were 2 to 8-fold compared with older non-migrants. After adjusting for socioeconomic status and health- and lifestyle indicators, Moroccan, Turkish and Surinamese migrants still had increased ORs for visual limitations [ORs (95% CI), respectively: 2.48 (1.49–4.14), 3.08 (1.75–5.41) and 1.97 (1.33–2.91)] compared with the Dutch. For mobility limitations, only the Turkish migrants had an OR twice as high (2.19; 1.08–4.44) as the non-migrants. No significant differences were found between Antillean/Aruban migrants and non-migrants. **Conclusions:** Important ethnic inequalities exist in various functional limitations, particularly in vision. These results underline the importance of tailored preventive interventions in older migrants to detect and prevent these limitations at an early stage.

Introduction

Functional limitations are a serious threat to healthy aging and a major public health concern, especially among the aging population diagnosed with chronic conditions. Studies have shown that as age increases, the chance of functional decline increases too, both among older adults with disabilities as well as among those with none.^{1,2} Also functional limitation has been linked to numerous consequences, including low quality of life, reduced social capital, increased risk of disabilities, falling, loss of independence, institutionalization, mortality and increased risk of healthcare expenditures.^{1,3,4} Furthermore, the prevalence of poor wellbeing and physical and mental health problems are reported to be greater among aging ethnic minorities and migrants with physical function limitations.^{5–7}

Disparities in functional limitations among ethnic minority and migrant groups are widely documented. Studies conducted in the USA show that aging Hispanics and African-American showed significantly higher levels of functional limitations compared with their US-born White counterparts.^{8,9} Similarly, in the UK, older South Asians and African Caribbean minority groups reported higher odds of functional limitations compared with White British older adults.² Furthermore, existing studies have demonstrated significant differences in the causes of functional limitations among ethnic minority

and migrant groups. For example, previous work shows that functional limitation inequalities are partly explained by known risk factors including socioeconomic deprivation and unhealthy behaviour.^{10–15} That is, ethnic minorities with low socioeconomic status (SES)—a measure of one's education, income or occupational status—are known to have more functional limitations, are less physically active and are more obese, compared with their native-born older peers.^{16,17}

Despite the compelling evidence from the USA and UK of ethnic inequalities in functional limitations, research on these ethnic differences in limitations are currently lacking in other European countries, including the Netherlands. First, most studies in this field have examined African American and Hispanic populations in the USA comparing them to White Americans. However, these comparisons are not applicable to the European context, due to ethnic compositions varying across countries and ethnic groups differing by country of birth. For instance, the proportion and background of ethnic minorities living in Europe differ from country to country, but some ethnic groups are overrepresented in several countries. For example, in Germany, Turkish people form the largest migrant group, while in the Netherlands and Belgium, they are the second largest migrant group. Moroccan migrants are the largest group in Belgium and Spain, while in the Netherlands they are the third largest group.¹⁸ Secondly, in the Netherlands, older ethnic minority group represents

a heterogeneous group that not only includes the so-called former guest workers mainly from Turkey and Morocco and their reunified family members, but also those from former colonies such as Suriname and Netherlands Antilles and refugees and asylum seekers. Lastly, most earlier Dutch studies on ethnic differences in health have not paid attention to older adults or have been focusing on only one category of older migrants^{6,19,20} or were carried out at least 15–20 years ago.^{7,16}

Given the projected rise in the prevalence of multimorbidity in the increasingly aging population,²¹ and their higher prevalence of many health conditions,^{17–20} older ethnic minority groups will be progressively more affected by functional limitations. Thus, gaining insight into the differences between ethnic groups in functional limitations may help contribute to the development of more extensive, tailored and intervention programmes to delay the onset and progression of functional limitations in these high-risk populations.

Therefore, the main aims of this study were 2-fold: (i) to assess whether ethnic differences in functional limitations exist by comparing the prevalence of functional limitations in Turkish, Moroccan, Suriname and Antillean/Aruban older adults to the general Dutch population and (ii) to examine whether the association between ethnicity and functional limitations can be explained by SES and health- and lifestyle-related factors.

Methods

This study used cross-sectional data (collected in 2012) from the National Dutch Health Survey (NDHS). Every four years, the Public Health Services of the four largest cities (Amsterdam, the Hague, Rotterdam and Utrecht) jointly conduct the NDHS to gain insight into the health of the local population. The rationale, conceptual framework, design and methodology of NDHS have been described in more details elsewhere.²²

Data collection and study sample

In each city a random sample of people aged 19 years and older was drawn from the municipal population registers. Eligible respondents were approached at least three times to fill out either a web-based questionnaire or a paper version. At the fourth and final measurement, non-respondents from the three major ethnic groups (i.e. Moroccans, Turkish and Surinamese), the so-called hard-to-reach groups, were contacted by phone or visited at their homes and were offered personal help to either fill out the questionnaire or take part in a personal interview in their preferred language.

This study used data from 12 652 respondents aged 55 year and older, including the following ethnic groups: 10 979 (87.4%) Dutch, 869 (6.9%), Surinamese, 298 (2.4%) Moroccan, 282 (2.2%) Turkish and 134 (1.1%) Antillean/Aruban. The overall response rate was 54% and was higher among the Dutch (57–60%) than among the migrants (23–35% in Moroccans, 28–35% in Turkish, 30–55% in Surinamese and 35–66% in Antilleans/Arubans).

Measures

Survey information was collected on socio-demographic and behavioural factors, physical and mental health, social well-being, lifestyle and healthcare use.

Functional limitations

We defined functional limitations as the inability to carry out functional tasks at the personal level required in activities of daily living, including mobility limitations and visual and hearing impairments. To establish these limitations, the validated questionnaire of the Organization for Economic Co-operation and Development (OECD) was used.²³ The following seven questions were used

Hearing limitations

Q1 ‘Can you have a conversation with one other person (with a hearing aid if required)?’ and Q2 ‘Can you follow a conversation in a group consisting of three or more persons (with a hearing aid if required)?’

Visual limitations

Q3 ‘Can you recognize someone’s face from a distance of 4 meters (with glasses or contact lenses if required)?’ and Q4 ‘Can you read small print in the newspaper (with glasses or contact lenses if required)?’

Mobility limitations

Q5 ‘Can you carry an object weighing 5 kilos (such as a full shopping bag) for a distance of 10 meters?’ and Q6 ‘Can you walk 400 meters without pausing (with a walking stick if necessary)?’ and Q7 ‘Can you bend over from a standing position and pick something up from the ground?’.

A four-point scale was used ranging from ‘yes, without difficulty’, ‘yes, with minor difficulty’, ‘yes, with major difficulty’ to ‘no, unable to do’. Respondents who reported having ‘major difficulty’ or were ‘not able’ to perform at least one activity, were classified impaired for that function category.²³ So, dichotomous variables (0 = without or with minor difficulty and 1 = major difficulty or unable) were created to categories older adults having hearing, visual or mobility limitations, respectively.

Ethnicity

Ethnicity was defined based on the country of birth of the resident and his/her parents, according to the definition of Statistics Netherlands.²⁴ A person is considered a minority/migrant if he/she was born abroad with ≥ 1 of the parents born abroad (first-generation minority) or if he/she was born in the Netherlands with ≥ 1 of the parents born abroad (second-generation minority). In the current study, we considered the four largest migrant groups from Turkey, Morocco, Suriname and Netherlands Antilles. Dutch older adults were used as the reference category. A person was identified as ‘ethnic Dutch’ if both parents were born in the Netherlands.

Socio-demographic and economic variables

These included age, gender, living conditions, education level and income. Living conditions was categorized into living alone or living together with someone else. Education (based on the highest level of completed education and classified into two groups: no or only primary school and middle or higher education) and income (annual household income) were used as indicators to measure SES.

Physical health

Perceived health was measured using the question: ‘How good is your health in general?’ Answers were dichotomized into fair or (very) bad vs. good to very good. The presence of chronic disorders was assessed using self-reported data on 19 chronic conditions for which the subject reported to be monitored or treated by a general practitioner/medical specialist. For this study information about the presence of diabetes, hypertension, asthma/COPD, cardiovascular disease (CVD), musculoskeletal disorders and urine incontinence was used. Obesity was measured by the body mass index (BMI) and categorized as being obese ($\text{BMI} \geq 30 \text{ kg m}^{-2}$) or not ($\text{BMI} < 30 \text{ kg m}^{-2}$).

Mental health

The 10-item Kessler Psychological Distress Scale (K10) was used to measure anxiety and depressive symptoms,²⁵ and loneliness was

measured using the 11-item Loneliness Scale.²⁶ Social exclusion was measured using the Social Exclusion Index for Health Surveys (SEI-HS), a four-dimensional index, which includes 'lack of social participation', 'material deprivation', 'lack of normative integration' and 'inadequate access to basic social rights'.²⁷

Behavioural variables

Lifestyle indicators included alcohol consumption (defined as consuming alcohol or not), smoking (yes or no) and physical inactivity (based on whether or not participants fulfilled the norm for healthy physical activity representing half an hour a day of physical activity for at least 5 days/week).

Analysis

All analyses were performed using SPSS version 24.0. We used χ^2 tests to compare the characteristics of the different ethnic groups. To examine the association between ethnicity and the various types of limitations, multivariate logistic regression analyses were conducted. Five models were used to examine the data. Model 1 adjusted for demographic variables (age and gender). Model 2 additionally adjusted for SES including living conditions to examine whether SES moderates ethnic differences in functional limitations. Model 3 further adjusted for physical health (perceived health, obesity and the presence of chronic disorders) and model 4 further adjusted for mental health indicators (anxiety and depressive symptoms, loneliness and social exclusion). Finally, model 5 further adjusted for lifestyle risk factors (alcohol consumption, smoking and physical activity). A *P* values < 0.05 was considered statistically significant.

Results

Background and health characteristics of the study population

Table 1 shows the demographic and health characteristics of the research sample. There were more women than men, but their proportions were not equally distributed according to ethnicity. Older migrants were, on average, younger, more poorly educated and were more likely to have the lowest household income than the Dutch.

Compared with the Dutch, older migrants less often perceived their health as (very) good, with Moroccans having the lowest scores, followed by the Turkish, Surinamese and Antilleans/Arubans.

Older Moroccans, Turkish and Surinamese had a higher prevalence of chronic diseases, mainly hypertension, diabetes and musculoskeletal disorders and reported more visual, hearing and mobility limitations and psychological health problems, such as loneliness and depression/anxiety symptoms than their Dutch counterparts. About one quarter of the four older minority groups had to deal with social exclusion (22.1–28.1%) compared with 5.0% among Dutch people. With regard to lifestyle, few ethnic differences were found for smoking, but alcohol intake varied largely according to ethnicity, with the Dutch having the highest proportion. All ethnic minority groups were more likely to be physically inactive and overweight than the Dutch.

Multivariate association between ethnicity and limitations

Table 2 presents the unadjusted and adjusted results for ethnic differences in mobility, visual and hearing limitations.

Mobility limitation

With the exception of the Antilleans/Arubans, all ethnic minorities were more likely to report mobility limitations compared with the Dutch older adults. The ORs increased even slightly after adjusting for age and gender. Older migrants had higher ORs for mobility

limitation [OR = 5.05 (95%: 3.56–7.15) in Moroccan; OR = 8.48 (95% CI: 5.93–12.14) in Turkish; OR = 2.01 (95% CI: 2.33–3.61) in Surinamese and OR = 2.03 (95% CI: 1.17–3.53) in Antilleans/Arubans]. Adjustment for age, gender, living conditions and socio-economic variables (model 2), attenuated the ethnic differences but removed significant differences only in Antilleans/Arubans. After further adjustment for physical health/chronic disorders (perceived health, diabetes, hypertension, CVD, obesity, asthma, musculoskeletal disorders, visual limitations and urine incontinence), Turkish migrants still had higher OR of mobility limitations (OR = 2.15; 95% CI: 1.22–3.78) than the Dutch. In the fully adjusted model (model 5) controlling for mental health and lifestyle indicators, Turkish older adults were significantly more likely to report mobility limitations than the Dutch. This relationship was not observed among the other three ethnic groups.

Visual limitation

Older migrants had higher OR's of reporting visual limitations compared with older Dutch. After adjusting for age and gender in model 1, the associations increased somewhat for all the ethnic groups but was not significant in Antillean/Aruban older adults. The ORs were respectively: 6.07 (95% CI: 4.29–8.60) in Moroccans, 7.13 (95% CI: 5.03–10.09) in Turkish and 3.24 (95% CI: 2.56–4.10) in Surinamese. Adding SES variables and living conditions to the model reduced the ethnic differences in visual limitations. Further adjustment for physical health, mental health indicators and lifestyle lowered the ORs for reported visual limitations in Moroccan, Turkish and Surinamese migrants, but the ethnic differences remained statistically significant. With the exception of Antillean/Aruban older adults, older migrants were 2–3 times more likely to report visual limitations than the Dutch.

Hearing limitation

The age and gender adjusted findings (model 1) revealed that older migrants were more likely to report hearing limitations as compared with the Dutch. The ORs were respectively: 2.32 (95% CI: 1.46–3.68) in Moroccans; 5.65 (95% CI: 3.79–8.42) in Turkish and 1.87 (95% CI: 1.29–2.72) in Surinamese. Further adjustment for SES variables and living conditions (model 2) removed the significant ethnic differences for hearing limitations, except for Turkish migrants who still had a 2.72-time higher OR than the Dutch. In the fully adjusted model (model 5) all older migrants were not more likely to report hearing limitations than their Dutch counterparts.

Discussion

The findings from this representative sample of the older population from the largest Dutch cities add new evidence to the existing literature about functional limitations by taking into account the diversity in ethnic backgrounds of the older adults. This study shows that older migrants have increased ORs for reporting mobility, visual and hearing limitations compared with their Dutch counterparts. With the exception of hearing limitations, these associations did not disappear entirely after adjusting for socio-economic and health-related factors. With regard to mobility limitations, after adjustment for relevant variables, only Turkish migrants, had increased ORs compared with the Dutch. No significant differences were found between Antilleans/Arubans and the Dutch in any functional limitations.

Our results of higher prevalences of functional limitations in the older migrants are consistent with previous research showing an association with ethnicity and self-reported functional limitations.⁶ An important finding of our study was that SES and health and lifestyle indicators could not explain the ethnic differences in visual limitations and the differences in mobility limitations in Turkish migrants compared with the Dutch. Although no such data are

Table 1 Socio-demographic characteristics of participants according to ethnicity (*N* unweighted numbers, % weighted*)

	Dutch, <i>N</i> (%)	Moroccan, <i>N</i> (%)	Turkish, <i>N</i> (%)	Surinamese, <i>N</i> (%)	Antillean/ Aruban, <i>N</i> (%)	Total, <i>N</i> (%)	<i>P</i> -value
Gender							<0.05
Male	5003 (45.7)	175 (53.9)	155 (55.9)	359 (44.6)	63 (46.9)	5755 (46.3)	
Female	5976 (54.3)	123 (46.1)	127 (44.1)	510 (55.4)	71 (53.1)	6807 (53.7)	
Age							<0.001
55–64	2510 (39.9)	105 (58.3)	83 (55.8)	274 (61.4)	53 (61.8)	3025 (43.6)	
65–74	4597 (31.5)	150 (31.8)	154 (33.1)	426 (27.0)	63 (29.7)	5390 (31.1)	
75+	3872 (28.6)	43 (9.9)	45 (11.1)	169 (11.6)	18 (8.5)	4147 (25.4)	
Living alone	4048 (41.2)	34 (12.4)	64 (25.4)	438 (51.3)	69 (45.6)	4653 (40.5)	<0.001
Education level							<0.001
None/primary	1628 (13.50)	224 (79.3)	203 (73.9)	323 (29.1)	30 (19.2)	2408 (19.5)	
Middle/higher	8668 (86.5)	40 (20.7)	40 (26.1)	473 (70.9)	94 (80.8)	9329 (80.5)	
Income							<0.001
Max € 15 200, –	1221 (13.0)	140 (44.2)	148 (57.2)	298 (31.3)	56 (45.0)	1863 (17.9)	
Max € 19 400, –	3020 (23.9)	96 (29.7)	70 (20.1)	223 (21.8)	26 (18.4)	3435 (23.8)	
≥ € 19 400, –	6712 (63.0)	62 (26.1)	63 (22.7)	345 (46.9)	48 (36.6)	7230 (58.3)	
Smoking	2041 (20.0)	18 (5.9)	49 (20.0)	148 (23.2)	28 (23.9)	2284 (19.9)	<0.001
Alcohol intake	8129 (80.3)	10 (4.8)	41 (19.3)	448 (64.7)	85 (73.1)	8713 (73.7)	<0.001
Physical activity	6774 (71.1)	150 (60.7)	127 (54.5)	421 (59.0)	65 (61.4)	7537 (68.8)	<0.001
Obesity (BMI ≥ 30 kg m ⁻²)	1879 (17.4)	61 (24.6)	117 (44.7)	176 (22.8)	42 (28.6)	2275 (19.2)	<0.001
Good perceived health	6408 (61.6)	49 (17.6)	59 (21.8)	258 (37.8)	58 (49.1)	6832 (56.1)	<0.001
Hypertension	2842 (31.6)	113 (47.7)	89 (40.4)	326 (45.8)	42 (34.3)	3412 (34.0)	<0.001
Diabetes	1504 (13.4)	117 (37.2)	92 (31.9)	290 (32.4)	28 (19.4)	2031 (16.9)	<0.001
≥ 1 cardiovascular disease	1356 (11.6)	35 (9.2)	71 (20.4)	167 (14.6)	11 (6.7)	1640 (12.0)	<0.01
≥ 1 musculoskeletal disorders	2500 (27.3)	106 (41.4)	131 (58.3)	283 (63.6)	31 (29.4)	3051 (29.9)	<0.001
Asthma/COPD	885 (9.6)	33 (10.2)	48 (21.4)	85 (12.5)	8 (7.0)	1059 (10.2)	<0.001
Urine incontinence	574 (6.2)	26 (11.0)	47 (18.0)	86 (9.9)	5 (2.9)	738 (7.1)	<0.001
Vision limitations	1122 (9.9)	119 (40.3)	113 (44.0)	250 (27.3)	21 (14.2)	1625 (14.0)	<0.001
Hearing limitations	834 (6.4)	42 (11.0)	66 (23.0)	87 (9.3)	8 (7.6)	1037 (7.4)	<.001
Mobility limitations	2577 (21.4)	150 (48.3)	170 (60.4)	396 (37.1)	43 (28.6)	3336 (25.4)	<0.001
Loneliness	4946 (46.8)	176 (62.8)	185 (72.9)	454 (55.8)	65 (52.1)	5826 (49.3)	<0.001
Depression/anxiety	4602 (42.1)	200 (73.5)	213 (77.1)	480 (52.5)	52 (38.1)	5547 (45.5)	<0.001
Social exclusion	537 (5.0)	63 (22.1)	83 (28.1)	196 (24.9)	36 (24.8)	915 (8.6)	<0.001

Table 2 Multivariate analysis of ethnic differences in mobility limitations, visual impairment and hearing limitations [OR (95% CI)]

	Model 0 OR (95% CI)	Model 1 OR (95% CI)	Model 2 OR (95% CI)	Model 3 OR (95% CI)	Model 4 OR (95% CI)	Model 5 OR (95% CI)
Ethnicity (Dutch ref)						
Mobility limitations						
Moroccan	3.42 (2.47–4.75)	5.05 (3.56–7.15)	2.75 (1.80–4.21)	1.55 (0.95–2.54)	1.71 (1.00–2.92)	1.49 (0.82–2.72)
Turks	5.59 (3.98–7.86)	8.48 (5.93–12.14)	4.23 (2.81–6.36)	2.15 (1.22–3.78)	2.17 (1.18–3.98)	2.19 (1.08–4.44)
Surinamese	2.16 (1.76–2.65)	2.01 (2.33–3.61)	2.13 (1.67–2.71)	1.22 (0.83–1.81)	1.15 (0.77–1.73)	1.12 (0.72–1.73)
Antillean/Aruban	1.46 (0.89–2.41)	2.03 (1.17–3.53)	1.60 (0.87–2.96)	1.16 (0.41–3.24)	1.00 (0.21–4.70)	0.96 (0.19–4.96)
Visual impairment						
Moroccan	5.38 (3.83–7.54)	6.07 (4.29–8.60)	3.50 (2.29–5.36)	2.64 (1.65–4.21)	2.76 (1.71–4.46)	2.48 (1.48–4.14)
Turks	6.26 (4.45–8.81)	7.13 (5.03–10.09)	3.51 (2.33–5.30)	3.12 (1.94–5.01)	3.04 (1.83–5.04)	3.08 (1.75–5.41)
Surinamese	3.00 (2.38–3.78)	3.24 (2.56–4.10)	2.60 (1.99–3.39)	2.05 (1.45–2.88)	1.99 (1.38–2.86)	1.96 (1.33–2.91)
Antillean/Aruban	1.32 (0.73–2.39)	1.46 (0.81–2.65)	1.29 (0.69–2.40)	0.58 (0.23–1.47)	0.51 (0.18–1.39)	0.58 (0.21–1.61)
Hearing limitations						
Moroccan	1.81 (1.43–2.87)	2.30 (1.46–3.68)	1.28 (0.74–2.21)	0.85 (0.45–1.61)	0.83 (0.43–1.61)	0.79 (0.38–1.66)
Turks	4.37 (2.98–6.40)	5.65 (3.79–8.42)	2.72 (1.65–4.49)	1.25 (0.72–2.18)	1.18 (0.66–2.12)	1.20 (0.61–2.21)
Surinamese	1.49 (1.03–2.16)	1.87 (1.29–2.72)	1.34 (0.90–2.00)	1.13 (0.71–1.80)	1.01 (0.62–1.63)	1.15 (0.70–1.88)
Antillean/Aruban	1.20 (0.52–2.80)	1.55 (0.65–3.69)	1.05 (0.40–2.78)	0.83 (0.26–2.72)	0.96 (0.31–3.03)	1.09 (0.35–3.41)

Model 0: crude; model 1: model 0 + age and gender; model 2: model 1 + SES (education level and income) + living alone; model 3: model 2 + physical health indicators (perceived health, obesity, hypertension, diabetes, cardiovascular diseases, musculoskeletal disorders, asthma/COPD and urine incontinence); model 4: model 3 + psychological health indicators (loneliness, depression/anxiety and social exclusion); and model 5: model 4 + lifestyle (smoking, alcohol intake and physical activity).

available with regard to older migrants in Europe to compare our results with, there are several studies among younger adult migrants that support our findings. For example, in a systematic review, Nielsen and Krasnik²⁸ showed a disadvantaged health position after

adjustment for age, gender and SES factors of Turkish and Moroccan migrants in the Netherlands, Belgium and in case of Turkish migrants in Sweden too. In our study, ethnic inequalities in the prevalence of hearing limitations were fully explained by SES

and relevant health variables. However, previous research shows contradictory findings. For example, Pugh and Crandell²⁹ found that differences between African American and White American seniors in self-report of hearing problems were not statistically significant; while Lin et al.³⁰ showed that African Americans were more likely to have normal to mild hearing loss than the White population.

There are several explanations for our finding of the persistent ethnic differences in visual limitations, even after adjustment for relevant variables. First, compared with older migrants, Dutch older adults are more likely to use and benefit from increased screening of chronic disease and vision impairment.³¹ When diagnosed at an earlier age, these problems may be better managed, and thereby reducing the risk of developing impairments. Secondly, the higher prevalence of health problems in ethnic minorities, such as diabetes and hypertension compared with the Dutch people may increase their risk of visual impairment. Earlier research had shown that the proportion of undiagnosed diabetes is high, particularly in disadvantaged populations.³² For example, although the proportion of undiagnosed diabetes in the USA fell from 2005 to 2010, this was mainly accounted for by White Americans while in minorities, these rates rose.³³ In the Netherlands, despite the higher rate of awareness and treatment for hypertension and diabetes among ethnic minorities compared with Dutch participants, control rates are lower, which might contribute to the higher rate of complications such as glaucoma (hypertension) or diabetic retinopathy (diabetes) causing different visual abnormalities.^{34,35} Lastly, a study by Scase and Johnson³⁶ found a much higher incidence of age-related cataracts among the Asian community in the UK when compared with Europeans. Worldwide cataract is considered the greatest cause of visual problems such as blindness³⁷ and in developing countries its onset is associated with early poverty and malnourishment and excess exposure to ultraviolet radiation.³⁸ This might also be applicable to the migrant groups included in our study, most originating from low and middle-income countries. They may have experienced poverty or poorer access to health care services during their childhood. Unfortunately, we have no data about the prevalence of these health problems in early life.

With regard to differences in ORs for the varied limitations between the ethnic minority groups, our findings show that Turkish migrants had the highest ORs, followed by Moroccans and Surinamese; while no significant differences were found between Antilleans/Arubans and the Dutch. The most probable explanation for these findings is a difference in use of health care services and knowledge about health and Dutch culture, due to language and cultural barriers. On average, Surinamese and Antilleans/Arubans are more well educated than Turkish and Moroccan migrants and are more familiar with the Dutch language and culture because of the colonial ties. In addition, the non-significant difference between Antilleans/Arubans and the Dutch could be attributed to the very limited number of respondents of Antillean/Aruban origin.

More research is needed to further identify the underlying factors that may explain the ethnic disparities, particularly in visual and mobility limitations between the migrants groups and the Dutch.

Our study has some limitations that should be considered. Because of the cross-sectional design, we could not exclude a possible reverse causality. Ethnic differences in response may also influence our results. However we are convinced that the efforts made to reach older migrants (e.g. home visits and phone calls) have improved the response rate among the migrants. The information on functional limitations is based on self-reports and could not be confirmed by objective data such as health examinations or diagnoses by physicians. However, there is no indication of results biased by differences in self-reports between older migrants and non-migrants, since the OECD questions have been proved valid and reliable in other studies, user-friendly and have been used for different ethnic groups.^{22,39} Furthermore, research comparing self-reported health problems with diagnoses by physicians has shown

high rates of agreement with chronic clinical notes for most of the major disabling conditions.⁴⁰ Lastly, since a large majority of older Turkish and Moroccan migrants is illiterate, they are probably more likely to report they could not read small print in the newspaper.

There are also strengths to our study including the relatively rare opportunity to include different older migrants as well as their Dutch counterparts in the same study, especially compared with other health surveys in the Netherlands and Europe in general. Furthermore, since older migrants constitute a very heterogeneous group, our study includes data on four different ethnic groups analyzed separately and compared with the Dutch population.

Our findings have public health implications. Migrants, especially older Turkish and Moroccan adults encounter several barriers, e.g. linguistic, financial and cultural in access to and use of health care services, including screening and preventive health services; more so than the Dutch. To reduce inequalities in functional limitations, preventive intervention should be tailored to the specific needs of older migrants, considering their limited health literacy and language and cultural barriers to using Dutch health care system (e.g. the use of aids). Moreover, interventions studies are needed to enhance healthy aging in general and therein to detect limitations at an early stage to prevent avoidable functional limitations in high-risk populations.

Funding

The authors received no specific funding for this work.

Conflicts of interest: None declared.

Ethical approval

This manuscript uses only secondary data, for this reason we do not enclose ethical approval.

Key points

- Although older migrants are a group of increasing demographic importance in Europe, there is little information about their health status and in particular functional limitations (mobility, hearing and vision).
- In our study, older migrants had higher prevalences of visual, hearing and mobility limitations than older Dutch adults.
- Adjustment for demographic, socioeconomic, health and lifestyle indicators did not explain the ethnic differences in visual limitations, nor the inequalities in mobility limitations between Turkish older migrants and their Dutch counterparts.
- It is important to emphasise the urgency of targeting preventive interventions to the specific needs of older migrants to tackle inequalities in functional limitations.

References

- 1 Yeom HA, Fleury J, Keller C. Risk factors for mobility limitation in community-dwelling older adults: a social ecological perspective. *Geriatr Nurs* 2008;29:133–40.
- 2 Williams ED, Cox A, Cooper R. Ethnic differences in functional limitations by age across the adult life course. *J Gerontol A Biol Sci Med Sci* 2020;75:914–21.
- 3 Rubenstein LZ, Powers CM, MacLean CH. Quality indicators for the management and prevention of falls and mobility problems in vulnerable elders. *Ann Intern Med* 2001;135:686–93.
- 4 von Bonsdorff M, Rantanen T, Laukkanen P, et al. Mobility limitations and cognitive deficits as predictors of institutionalization among community-dwelling older people. *Gerontology* 2006;52:359–65.

- 5 Gayman MD, Turner RJ, Cui M. Physical limitations and depressive symptoms: exploring the nature of the association. *J Gerontol B Psychol Sci Soc Sci* 2008;63: S219–28.
- 6 Reijneveld SA, Spijker J, Dijkshoorn H, Katz' ADL index assessed functional performance of Turkish, Moroccan, and Dutch elderly. *J Clin Epidemiol* 2007;60:382–8.
- 7 Poort EC. *Turkse en Marokkaanse ouderen in Amsterdam '99-'00: gezondheid, zelfredzaamheid en zorggebruik: Amsterdamse gezondheidsmonitor 1999-2000*. Amsterdam: GGD Amsterdam, 2001.
- 8 Hayward MD, Hummer RA, Chiu C-T, et al. Does the Hispanic paradox in U.S. adult mortality extend to disability? *Popul Res Policy Rev* 2014;33:81–96.
- 9 Melvin JE, Hummer RA, Elo IT, Mehta N. Age patterns of racial/ethnic/nativity differences in disability and physical functioning in the United States. *Demogr Res* 2014;31:497–510.
- 10 Mendes de Leon CF, Barnes LL, Bienias JL, et al. Racial disparities in disability: recent evidence from self-reported and performance-based disability measures in a population-based study of older adults. *J Gerontol B Psychol Sci Soc Sci* 2005;60: S263–71.
- 11 August KJ, Sorkin DH. Racial and ethnic disparities in indicators of physical health status: do they still exist throughout late life? *J Am Geriatr Soc* 2010;58:2009–15.
- 12 Thorpe RJ, Koster A, Kritchevsky SB, et al.; Health, Aging, and Body Composition Study. Race, socioeconomic resources, and late-life mobility and decline: findings from the Health, Aging, and Body Composition Study. *J Gerontol A Biol Sci Med Sci* 2011;66:1114–23.
- 13 Cené CW, Dilworth-Anderson P, Leng I, et al. Correlates of successful aging in racial and ethnic minority women age 80 years and older: findings from the Women's Health Initiative. *J Gerontol A Biol Sci Med Sci* 2016;71 Suppl 1:S87–99.
- 14 Latham K. Racial and educational disparities in mobility limitation among older women: what is the role of modifiable risk factors? *J Gerontol B Psychol Sci Soc Sci* 2014;69:772–83.
- 15 Ostchega Y, Harris TB, Hirsch R, et al. The prevalence of functional limitations and disability in older persons in the US: data from the National Health and Nutrition Examination Survey III. *J Am Geriatr Soc* 2000;48:1132–5.
- 16 United Nations. Migration and migrant population statistics. Statistics Explained Source: Statistics Explained, March 2020. Available at: <https://ec.europa.eu/eurostat/statisticsexplained/> (05 August 2019, date last accessed).
- 17 Reijneveld SA. Reported health, lifestyles, and use of health care of first-generation immigrants in The Netherlands: do socioeconomic factors explain their adverse position? *J Epidemiol Community Health* 1998;52:298–304.
- 18 Verhagen I, Ros WJ, Steunenberg B, de Wit NJ. Ethnicity does not account for differences in the health-related quality of life of Turkish, Moroccan, and Moluccan elderly in the Netherlands. *Health Qual Life Outcomes* 2014;12:1–8.
- 19 Schellingerhout R. *Gezondheid en welzijn van allochtone ouderen [Health and Well-Being of Ethnic Minorities Elderly]*. The Hague: The Netherlands Institute for Social Research, 2004.
- 20 El Fakiri F, Bouwman-Notenboon J. *Gezondheid van oudere migranten in de vier grote steden [Health of Older Migrants in the Four Largest Cities of The Netherlands]*. Amsterdam: Public Health Service of Amsterdam, 2015.
- 21 Ikram UZ, Kunst AE, Lamkaddem M, Stronks K. The disease burden across different ethnic groups in Amsterdam, the Netherlands, 2011-2030. *Eur J Public Health* 2014;24:600–5.
- 22 van den Brink C. Lokale en Nationale Monitor Gezondheid. Op weg naar één bron voor lokale, regionale en landelijke cijfers.[Towards one datasource for local, regional and national figures. *Tijds Gezondheidswetenschappen* 2011;89: 83–4.
- 23 McWhinnie JR. Disability assessment in population surveys: results of the OECD common development effort. *Rev Epidemiol Sante Publique* 1981;29:413–9.
- 24 Stronks K, Kulu-Glasgow I, Agyemang C. The utility of 'country of birth' for the classification of ethnic groups in health research: the Dutch experience. *Ethn Health* 2009;14:255–69.
- 25 Kessler RC, Andrews G, Colpe LJ, et al. Short [Database] screening scales to monitor population prevalences and trends in non-specific psychological distress. *Psychol Med* 2002;32:959–6.
- 26 Van Tilburg TG, De Leeuw ED. Stability of scale quality under different data collection procedures: a mode of comparison on the 'de Jong Gierveld Loneliness Scale'. *Int J Public Opin Res* 1991;3:69–85.
- 27 van Bergen AP, Hoff SJ, Schreurs H, et al. Social Exclusion Index-for Health Surveys (SEI-HS): a prospective nationwide study to extend and validate a multi-dimensional social exclusion questionnaire. *BMC Public Health* 2017;17:253.
- 28 Nielsen SS, Krasnik A. Poorer self-perceived health among migrants and ethnic minorities versus the majority population in Europe: a systematic review. *Int J Public Health* 2010;55:357–71.
- 29 Pugh KC, Crandell CC. Hearing loss, hearing handicap, and functional health status between African American and Caucasian American seniors. *J Am Acad Audiol* 2002;13:493–502.
- 30 Lin FR, Thorpe R, Gordon-Salant S, Ferrucci L. Hearing loss prevalence and risk factors among older adults in the United States. *J Gerontol A Biol Sci Med Sci* 2011; 66:582–90.
- 31 Van Berkum MTM, Smulders EMC. *Migranten, preventie en gezondheidszorg [Migrants, Prevention and Healthcare]*. Utrecht: Pharos, 2010.
- 32 Fisher-Hoch SP, Vatcheva KP, Rahbar MH, McCormick JB. Undiagnosed diabetes and pre-diabetes in health disparities. *PLoS ONE* 2015;10:e0133135.
- 33 Gregg EW, Zhuo X, Cheng YJ, et al. Trends in lifetime risk and years of life lost due to diabetes in the USA, 1985–2011: a modelling study. *Lancet Diabetes Endocrinol* 2014;2:867–74.
- 34 Snijder MB, Agyemang C, Peters RJ, et al. Case finding and medical treatment of Type 2 diabetes among different Ethnic minority groups: the HELIUS Study. *J Diabetes Res* 2017;2017:9896849.
- 35 Agyemang C, Kieft S, Snijder MB, et al. Hypertension control in a large multi-ethnic cohort in Amsterdam, The Netherlands: the HELIUS study. *Int J Cardiol* 2015;183:180–9.
- 36 Scase MO, Johnson MRD. Visual impairment in ethnic minorities in the UK. *Int Congr Ser* 2005;1282:438–42.
- 37 Flaxman SR, Bourne RRA, Resnikoff S, et al. Global causes of blindness and distance vision impairment 1990–2020: a systematic review and meta-analysis. *Lancet Glob Health* 2017;5:e1221–e1234.
- 38 Javitt JC, Wang F, West SK. Blindness due to cataract: epidemiology and prevention. *Annu Rev Public Health* 1996;17:159–77.
- 39 Eekhof JA, De Bock GH, Schaapveld K, Springer MP. Screening for hearing and visual loss among elderly with questionnaires and tests: which method is the most convincing for action? *Scand J Prim Health Care* 2000;18:203–7.
- 40 Skinner KM, Miller DR, Lincoln E, et al. Concordance between respondent self-reports and medical records for chronic conditions: experience from the Veterans Health Study. *J Ambul Care Manage* 2005;28:102–10.