Poor self-rated health in adult patients with type 2 diabetes in the town of Södertälje: a cross-sectional study

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Key points

- This study highlights the relationship between self-rated health and ethnicity in subjects with type 2 diabetes.

- Socioeconomic factors did not explain the ethnic differences in rating poor general health.

- Unemployed/retired patients with type 2 diabetes, regardless of ethnicity, had the highest odds ratio for reporting poor general health.

Abstract

Objectives: Several studies indicate that ethnicity may be a strong predictor of poor self-rated health (SRH). The aims of the present study were to investigate whether there was an association between ethnicity and poor SRH in subjects with type 2 diabetes and to determine if the association remained after adjusting for possible confounders such as age, gender employment, marital status, and education. *Design:* A cross-sectional study based on a patient population in the town of Södertälje. An unconditional logistic regression was performed to estimate the odds ratios (ORs) and 95% confidence intervals (95% CIs). *Setting:* Four primary health care centers. *Subjects:* A total of 354 individuals were included: Assyrian/Syrian-born (n = 173) and Swedish-born (n = 181). *Results:* The odds ratio for rating poor SRH for Assyrian/Syrian subjects with type 2 diabetes was 4.5 times higher (95% CI = 2.7–7.5) than for Swedish patients in a crude model. After adjusting for possible confounders, unemployed/retired people had 5.4 times higher odds for reporting poor SRH than employees (OR =5.4; 95% CI = 2.3–12.5). Women had 1.8 times higher odds (95% CI = 1.0–3.0) for reporting poor SRH than men. In the final model poor SRH among Assyrians/Syrians decreased but still remained significant (OR=3.7; 95% CI = 2.5–6.6).

Conclusions: **The findings in this study are important for planning primary health care services. They highlight the crucial importance of being aware of the subjective health status of immigrants fleeing from war in the Middle East and resettling in Sweden.**

Key words: Assyrians/Syrians, ethnicity, type 2 diabetes, self-rated health

Self-rated health (SRH) is a powerful and independent predictor of long-standing chronic diseases; although its biological basis is unknown some studies have shown an association with circulating cytokines in women (1). It has been documented that SRH is a major predictor of morbidity, mortality, and health services utilization (2-5). Furthermore, SRH is an important indicator of the quality of life as well as a good predictor of future health (6) and mortality in persons with diabetes (7). In addition, age and gender (8), life satisfaction (9), and heritability (10) are factors related to SRH.

Several studies indicate that SRH is poorer among immigrants than in native populations in Western countries, and belonging to a particular ethnic group has been shown to be a strong predictor of poor mental health and poor subjective health (11-13). However, there are some studies showing that immigrants in general have a higher prevalence of poor SRH (14, 15) and that Swedes report the highest prevalence of good health compared to ten European countries (16).

The novelty of this primary health care study is the analysis of SRH in a group of foreign-born patients, i.e. Assyrians/Syrians with type 2 diabetes, and their controls in Södertälje, south of Stockholm.

The aims of the study were to investigate whether there was an association between ethnicity and poor self-rated health in subjects with type 2 diabetes and to analyze whether the association remained after adjusting for possible confounders such as gender, age, employment, marital status, and educational level.

Material and Methods

This study was conducted during 2006–08 at four primary health care centers in the town of Södertälje. Because of the fact that immigrants in the official Swedish statistics are not registered by ethnicity but according to country of birth, parents' country of birth and

citizenship, the procedure for identifying potential participants in this study was carried out by the first author and personnel from the primary health care centers in two stages. Participants were selected from the register of diabetes patients by examining the list of prospective respondents using surnames and the health care center personnel's personal knowledge of patients. Afterwards these patients were contacted by phone by health care center personnel who, after obtaining their verbal informed consent by phone, invited them to fill out the questionnaire at the primary health care center. The face-to-face interviews were done in the presence of the first author or a GP, who helped with the questions as needed. Interpreters were also used as needed. Those who identified themselves as neither Assyrian/Syrian nor Swedish were excluded from the study. Verbal informed consent was obtained for the gathering of medical information and laboratory data from patient records.

A total of 354 individuals were included: Assyrian/Syrian-born (n = 173) and Swedish-born (n = 181). The majority of Assyrians/Syrians originated from Turkey (33.5%) and Iraq (30.6%).

Outcome variables

Self-rated health is based on the question: "*How do you rate your general state of health?*" Those who reported their general state of health as "very poor" or "poor" were grouped as having poor SRH and having good SRH if they reported "very good", "good", or "rather poor".

Explanatory variables

Age was categorized into three groups: 32–59, 60–69 and ≥70 years.

Ethnicity was defined as Swedish-born and Assyrian/Syrian-born immigrants including both first and second-generation immigrants. There are two ways of self-identification among

the studied immigrant population which have historic and cultural explanations and we have therefore chosen to regard them as one ethnic group with two identification definitions, thus Assyrians/Syrians.

Employment status during the preceding week consisted of two alternatives: (1) employed (including any type of employment, sick leave, and vacation) and (2) unemployed/retired (including unemployment, retirement, and studies).

Marital status was classified as married/cohabiting or living alone/with children/siblings.

Educational level was divided into three groups according to the duration of school education: (1) low (<9 years), (2) intermediate (9–11 years) and (3) high (>11 years).

Statistical analyses

Differences in poor SRH between both ethnic groups were tested regarding sociodemographic characteristics using Pearson´s chi-2 test and the t-test. The statistical software used was Stata version 9 (17). Unconditional logistic regression was performed to assess the association between poor SRH and the explanatory variables. The results are shown as the odds ratios (ORs) and 95% confidence intervals (95% CIs). All explanatory variables, i.e. gender, age, employment, marital status, and educational level, were included stepwise in the models. The fit of the models was assessed using the Hosmer-Lemeshow goodness-of-fit test. The models were considered acceptable at $p > 0.05$, and all models met this demand (18). The statistical power was 82%, which is quite acceptable.

Ethical considerations

The study was approved by the Regional Ethical Committee of the Karolinska Institute (reference No. 2006/4:8, 2006-09-27).

Results

Table 1 shows the distribution of explanatory variables by ethnicity. In general, the Swedish population was older, with a mean age of 64, while the Assyrian/Syrian population was younger with a mean age of 61. The gender distribution of the two ethnic groups was similar. Assyrian/Syrians had a lower educational level (e.g. 20.0% of them were illiterate: 25.0% of women and 14.6% of men) than the Swedes. Furthermore, 18.0% of Assyrians/Syrians and 32.0% of Swedes had employment.

Table 1 here

Table 2 shows the prevalence of the outcome variable, poor SRH, in the two groups. The unadjusted prevalence of poor SRH was significantly higher among Assyrians/Syrians (43.0%) than Swedes (14.4%). The prevalence of poor SRH increased with younger age in the Assyrian/Syrian ethnic group and decreased in Swedish-born individuals, but age differences within the older age group ($\geq$ 70) are not statistically significant.

Table 2 here

The crude odds ratio for rating poor SRH for Assyrian/Syrian subjects with type 2 diabetes was 4.5 times (95% CI = 2.7–7.5) higher than for Swedes (not shown in Table). Table 3

shows one gender- and age-adjusted model and one model with all explanatory variables included. In the gender- and age-adjusted model Assyrians/Syrians had 4.5 times higher odds for reporting poor SRH than Swedes (95% CI = 2.7–7.5). The odds ratio decreased to 3.7 (95% CI = 2.5–6.6) in the full model including all explanatory variables. Women had 1.8 higher odds for reporting poor SRH than men (95% CI = 1.1–3.1). Older age groups (60–69 and ≥70) had a significantly lower odds ratio for reporting poor health than the youngest age group (32–59). Unemployed/retired individuals had the highest odds ratio with OR 5.4 (95% CI 2.3–12.5).

Table 3 here

Discussion

The main finding of this study is that Assyrian/Syrian-born individuals reported significantly poorer SRH than Swedish-born ones, even after taking all confounders into account. Furthermore, being female and being unemployed/retired were also significantly and independently related to poor SRH. Unexpectedly, the youngest age group (32–59) had poorer health than the older age groups.

The association between age, gender, and poor self-rated health is well documented and it has been shown that women report poorer health than men, which is in line with our finding (8, 19, 20). Several studies concluded that health deteriorates with advancing age and it is noteworthy that the tendency to report better health is increasing with older age in the Assyrian/Syrian-born ethnic group and that the opposite pattern prevails in the Swedish-born sample. In our attempts to explain this finding, we did not find any interaction between ethnicity and all other explanatory variables. But we cannot draw any conclusions due to the fact that the youngest group in this study is small. We believe that further prospective studies

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are needed to investigate why younger Assyrian/Syrian-born patients with type 2 diabetes report the poorest health.

A Swedish study in 16,080 twins aged over 45 showed that both lifestyle factors and health behaviors such as pain, lack of exercise, smoking, obesity, stress, personality, and unemployment are related to reporting poor health (21). In the present study we include only unemployed/retired, which was shown to have the highest odds ratio for reporting poor health regardless of ethnicity. Even if the majority of participants in this study were over 60 years old (in total, 30%) and were retied (in total, 60%), a large number of younger Assyrians/Syrians were unemployed (65.0%) compared to Swedish-born subjects (27.1%). However, we believe that lifestyle and both physical and mental health factors should be included in investigations of SRH in prospective studies.

Our finding regarding ethnic differences in rating SRH as poor agrees with conclusions reported in many studies on immigrant's health in general (2, 11, 12, 22), as well as in diabetic cohorts. It is concluded that SRH predicts mortality in persons with diabetes. On the other hand, it has been shown that socioeconomic circumstances are an important independent predictor of health among people with diabetes (23) and SRH in and of itself may provide information on patient risk independently of socioeconomic, demographic, and clinical risk factors for mortality (7).

Our findings are in line with previous research on self-reported health in Assyrians participating in the nationwide Survey of Living Conditions in immigrant groups living in Sweden (Inv-ULF) in 1996 (24): the self-rating of health as poor was more prevalent in Assyrians than in Swedes (46.9% vs. 18.0%) (25). Because of a lack of information on chronic diseases in Inv-ULF, it was not possible to make an exact comparison. However, the same pattern in reporting poor health was observed in the study discussed above as in our study. Several researchers have explained various patterns in different countries and in

different ethnic groups in terms of cultural differences. For example, a study done in subjects aged 50 from 10 European countries showed that Swedish and Danish respondents reported the best health, which is explained as over-rating (16). Thus, the reporting of poor health can be affected by cultural attitudes as well as migration factors, and not only among persons with diabetes. In our data 54.0% of the Assyrian/Syrian group reported migration to be due to political or religious reasons, which may increase their vulnerability to poor health. We believe that the migration process in and of itself as a stress-inducing phenomenon could be a reason for the poor health of immigrants, which view is supported by other studies (9, 11, 14, 26, 27).

The major strength of this study is the fact that it is the first such study investigating the "hidden" ethnicity of persons originating from different countries in the Middle East. It is based on self-identification of ethnicity, and not on affiliation to geographic areas, and lays the foundation for future studies in a somewhat homogeneous ethnic group. Another strength of this study is that the sample includes two ethnic groups from the same neighborhood and thereby avoids a possible influence of neighborhood on health status. On the other hand, this study has several limitations. The first one is that the sample represents Assyrian/Syrian patients with type 2 diabetes living in one town and the results cannot be generalized to the whole diabetic Assyrian/Syrian population in Sweden. Another limitation is that the cross-sectional nature and the small sample size preclude the possibility of drawing extensive causal conclusions. A third limitation may be the unexplained confounders included in the logistic regression models in conformity with the aim of the study. Furthermore, there are lifestyle-related factors and a risk of type 2 errors in the study which calls for prospective studies.

In conclusion, this study provides important knowledge concerning Assyrian/Syrian immigrants' ratings of poor SRH and could be useful in clinical practice. The findings are important for planning primary health care services. They highlight the crucial importance of

being aware of the subjective health status of immigrants fleeing from the war in the Middle East and resettled in Sweden.

Competing interests

The authors declare that they have no competing interests.

Acknowledgments

Tables

Table 1. The distribution (%) of the explanatory variables by ethnicity and test of differences in distribution (chi-2), n = 354

Variable	Swedes n = 181	Assyrians/Syrians n = 173	Test of differences in distribution, p-value
Total, %	51.1	48.9	
Gender			0.411
Female	44.2	48.5	
Male	55.8	51.5	
Age (mean; standard deviation)	64 (10.6)	61 (10.8)	**0.038**
Age group			**0.030**
32–59	32.6	46.2	
60–69	32.6	27.2	
≥ 70	34.8	26.6	
Marital status			**0.000**
Single	40.0	21.5	
Married/cohabiting	60.0	78.5	
Educational status			**0.000**
Low < 9 years	49.2	74.0	
Intermediate 9–11 years	21.0	4.6	
High > 11 years	29.8	21.4	
Employment			**0.002**
Yes	32.0	18.0	
No	68.0	82.0	

Table 2. The prevalence (%) of poor SRH by ethnicity and explanatory variables with test of differences (chi-2).

| Variables | Poor self-rated health | | Test of differences |
	Swedish	Assyrian/Syrian	
Total, %	**14.4**	**43.0**	**0.000**
Age			
32–59	**12.2**	**48.5**	**0.000**
60–69	**10.7**	**43.8**	**0.000**
≥ 70	21.1	32.5	0.204
Gender			
Female	**18.8**	**50.6**	**0.000**
Male	**11.0**	**36.0**	**0.000**
Employment			
Yes	**5.2**	**22.6**	**0.013**
No	**18.7**	**47.5**	**0.000**
Marital status			
Single	**18.3**	**47.0**	**0.001**
Married/cohabiting	**11.2**	**41.5**	**0.000**
Educational level			
< 9	**16.9**	**46.1**	**0.000**
9–11	15.8	25.0	0.532
> 11	**9.3**	**36.1**	**0.002**

Bold-faced numbers are statistically significant.

Table 3. The odds ratios (ORs) with 95% confidence intervals (95% CIs) for poor SRH (M 1, M 2) for Assyrians/Syrians with Swedish-born individuals as reference group.

Variable	Model 1*	Model 2*
Swedish-born	1	1
Assyrian/Syrian-born	**4.5**	**3.7**
	(2.7-7.5)	**(2.5-6.6)**
Gender		
Male	1	1
Female	**1.9**	**1.8**
	(1.1–3.1)	(1.0–3.0)
Age groups (years)		
32–59	1	1
60–69	0.7	**0.4**
	(0.4–1.2)	(0.2–0.7)
≥70	1.00	**0.4**
	(0.5–1.8)	(0.2–0.9)
Employment/retirement		
Yes		1
No		**5.4**
		(2.3–12.5)
Marital status		
Married/cohabiting		1
Single		1.4
		(0.8–2.6)
Educational level		
< 9 years		1
9–11 years		0.8
		(0.3-2.1)
> 11 years		0.8
		(0.4-1.5)

*Model 1 is adjusted for age and gender.
**Model 2 is adjusted for all explanatory variables.

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