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Does socioeconomic status make a difference? A register-based study on the extent to which cardiovascular screening in patients with inflammatory arthritis leads to recommended follow-up in general practice

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ABSTRACT

Objective To investigate to what extent patients with inflammatory arthritis (IA) follow recommendations given in a secondary care nurse-led cardiovascular (CV) risk screening consultation to consult their general practitioner (GP) to reduce their CV risk and whether their socioeconomic status (SES) affects adherence.

Methods Adults with IA who had participated in a secondary care screening consultation from July 2012 to July 2015, based on the EULAR recommendations, were identified. Patients were considered to have high CV risk if they had risk Systematic COronary Risk Evaluation (SCORE) ≥5%, according to the European SCORE model or systolic blood pressure ≥145 mmHg, total cholesterol ≥8 mmol/L, LDL cholesterol ≥5 mmol/L, HbA1c ≥42 mmol/mol or fasting glucose ≥6 mmol/L. The primary outcome was a consultation with their GP and at least one action focusing on CV risk factors within 6 weeks after the screening consultation.

Results The study comprised 1265 patients, aged 18–85 years. Of these, 336/447 (75%) of the high-risk patients and 580/819 (71%) of the low-risk patients had a GP consultation. 127/336 (38%) of high-risk patients and 160/580 (28%) of low-risk patients received relevant actions related to their CV risk, for example, blood pressure home measurement or prescription for statins, antihypertensives or antidiabetics. Education ≥10 years increased the odds for non-adherence (OR 0.58, 95% CI 0.0.37 to 0.92, p=0.02).

Conclusions 75% of the high-risk patients consulted their GP after the secondary care CV risk screening, and 38% of these received an action relevant for their CV risk. Higher education decreased adherence.

Key messages

What is already known about this subject?

► Cardiovascular risk screening of patients with inflammatory arthritis has been implemented in many countries in accordance with EULAR guidelines from 2010, but little is known about the subsequent risk management.

What does this study add?

► This study reveals that at least 25% of the patients with high cardiovascular risk did not follow the recommendation to contact their general practitioner for a follow-up.
► Higher education decreased the odds to follow recommendations for a follow-up.
► The diagnosis of SpA, AS or PsA significantly increased the odds of having a consultation at general practice with a relevant action compared to RA-patients.
► Gender, age, diagnosis, cohabitant status and employment status did not influence whether the high risk patients consulted their general practitioner.

How might this impact on clinical practice?

► This study emphasises the need for improved communication and collaberation across healthcare sectors about shared cardiovascular risk management.

BACKGROUND

Socioeconomic status (SES) plays an important role in health.[1][2] Low SES is linked to greater all-cause mortality, even when adjusted for cardiovascular (CV) risk factors. Unemployment and comorbidity significantly increase mortality in patients with rheumatoid arthritis (RA).[1] In addition, SES is associated with utilisation of services provided by general practice. Being older, female, having lower income, shorter education, being unemployed or living alone are associated with higher consultation rates in general practice.[3][4] However, poor SES is linked with lower use of health services among patients with RA.[5] Many studies and reviews have

investigated adherence to treatment for patients with RA with results ranging from 22% to 107%[6] and no clear association to SES on treatment adherence.[7]

The risk for CV disease is significantly elevated in patients with RA and other inflammatory joint disorders, such as ankylosing spondylitis (AS) or psoriatic arthritis (PsA), compared to the general population.[8] For patients with RA, the risk is almost doubled, similar to that of patients with diabetes mellitus.[8 9] Recent studies reveal that CV risk management for patients with RA and PsA is still suboptimal, and the majority of patients remain under-treated,[10 11] despite that the first recommendations for CV risk management from the EULAR were published in 2010.[8]

Since 2011, nurse-led screening for CV risk factors, in accordance with the EULAR recommendations[8] and national guidelines,[12] has been offered to patients with RA who are associated with the outpatient clinic at Danish Hospital for Rheumatic Diseases, Sønderborg (previously King Christian X's Hospital for Rheumatic Diseases, Graasten), Denmark[13] as part of normal clinical practice. As of 2012, the service has included patients with RA, PsA, spondyloarthritis (SpA) and AS.[14] In addition to the patients' regular follow-up visits, they are invited to attend a 30 min CV screening consultation with a rheumatology outpatient nurse. Before the screening consultation, measurements are taken of triglycerides, total cholesterol, high-density lipoprotein (HDL) and low-density lipoprotein (LDL) cholesterol levels and fasting glucose (FG) (from January to June 2012) or haemoglobin A1c (HbA1c) (as of June 2012). In addition, each patient's height, weight, waist circumference and blood pressure (BP) are measured. The patient's body mass index (BMI) is calculated. The patients' habits regarding diet, smoking, exercise and alcohol are discussed with the patient based on a motivational interviewing approach.[15] Each patient's risk Systematic COronary Risk Evaluation (SCORE) is calculated, based on age, gender, smoking habits, systolic BP (SBP) and total cholesterol/HDL ratio, in accordance with the European SCORE model.[16] The intervention is described in detail in a previously published article.[13] In patients with RA, the risk SCORE is multiplied with 1.5 to achieve a modified risk score (mSCORE), in line with the EULAR recommendations for CV risk management from 2010[8] and from November 2016 in accordance with the updated EULAR recommendations.[17] The CV screening consultation is documented in the Danish National Rheumatology Quality Database, the DANBIO registry.[18]

This nurse-led screening intervention started as an attempt to support a reduction of patients' risk for CV disease.[8 9 19–21] At the screening consultation, the nurses recommend high-risk patients that they consult their general practitioner (GP) after the screening consultation, to avail of support to lower their CV risk. It is the patients' responsibility to contact their GP.

The aim of the present study is to investigate to what extent patients follow the recommendation to consult their GP, and whether SES affects adherence to the recommendation.

METHODS
Setting
The Danish healthcare system is tax-funded, and more than 98% of the population is registered with a GP. The GP acts as a gatekeeper, performing initial diagnostics and treatment and referring patients to secondary care, when required.[22] All citizens have free and equal access to healthcare services.[23] When going to hospital, the patients are offered reimbursement of travel expenses depending on distance to the hospital, income and whether they are retired. They are assigned a unique civil registration number, and each general practice is registered with their own unique identification number. These identification numbers enable accurate linkage of patients and general practices across all national registers.[23]

Danish general practices are organised as publicly financed private clinics. GPs receive payment per consultation, and specific services provided to each patient. This information is held in the Danish National Health Service Register (NHSR). Only services that incur a GP fee are registered.[22]

Study design and population
The present study is a register-based cohort study. Patients who had participated in a secondary care nurse-led CV screening consultation were identified in the DANBIO registry. Inclusion criteria were as follows: patients registered with RA, PsA, AS or SpA; aged 18–85 years; and with participation in at least one screening consultation between July 2012 and July 2015 at the Danish Hospital for Rheumatic Diseases. Patients with known diabetes mellitus, who are supposed to have regular follow-ups in general practice were excluded, whereas patients with known CV disease were included, as they usually do not have regular follow-ups with their GP.

Registry data
The following data were retrieved from the DANBIO registry: age, diagnosis, disease duration, IgM-rheumatoid factor status, anti-cyclic citrullinated peptide status, extra-articular manifestations, known CV disease, known diabetes mellitus, present smoking status, alcohol consumption (above or below the national recommended limits (maximum 7 units per week for women and 14 units per week for men)), SBP, total cholesterol, LDL cholesterol, HDL cholesterol, triglycerides, HbA1c or FG, BMI, waist circumference, exercise frequency (cannot exercise due to the condition, do not exercise regularly, exercises one to two times a month, one to two times per week, three to four times per week or five times or more per week) and the patients' risk SCORE/mSCORE.

Data were obtained from the DANBIO registry and were merged with data from the NHSR, Register of Medicinal Product Statistics (LSR) and Statistics Denmark (DST). Data were linked to each person via the Danish Civil Registration System.[24]

Data on patients' face-to-face consultations and other services provided by general practice were retrieved from NHSR.

Data on educational level, cohabitation status, labour market affiliation and income were retrieved from DST. Educational level was defined as the highest attained educational qualification, categorised according to the International Standard Classification of Education.[25] Educational levels were dichotomised: basic education (0–10 years of schooling) or higher education (above 10 years of schooling). Cohabitant status was dichotomised: living alone or cohabiting. Labour market affiliation was based on main employment during the past 12 months and dichotomised: employed or not employed, hence retired, unemployed or other. Personal income was dichotomised based on the reported personal disposable income after taxation and interest: the lowest third and the highest two-thirds.

Data regarding first-time medical prescriptions of diuretics, β-blockers, calcium antagonists, ACE inhibitors, combination antihypertensive drugs, statins and antidiabetics were obtained from the LSR for the first 6 weeks post-screening.

Definitions

The patients were categorised into two groups: high-risk and low-risk. The risk level reflected whether the nurses would recommend the patient to visit their GP based on risk factors identified at the CV screening visit (table 1). If one or more of the risk factors were above the defined threshold, the patient was considered to be at high risk. Patients >65 years of age were only recommended to consult their GP on the basis of their individual risk factors, given that the SCORE system does not apply to these patients.[16] As our interest was to explore whether patients followed the recommendation to see their GP after the screening consultation, patients with known

CVD were only considered as high-risk patients in this study if they were recommended to consult their GP when their individual risk factors indicated this (table 1).

Outcomes

The primary outcome was 'GPseen' which was defined as a visit to general practice in the first 6 weeks after attending the screening consultation.

Secondary outcomes were 'GPseen with action', where the outcome was GPseen in connection to at least one registered relevant action at the same consultation: measurement of HbA1c, FG, any type of venous blood sample or a BP home measurement, or a first-time prescription registered in the LSR of diuretics, antihypertensive medicines, statins or antidiabetics, and the patient had not been prescribed the medication for the last 6 months prior to the screening visit.

Statistical analysis

Standard descriptive statistics were used including mean and SD for continuous variables, and frequency and percentage for categorical variables. Patient characteristics were summarised descriptively for all patients as well as for low- and high-risk patients separately and compared between low- and high-risk patients by the χ^2 test for binary variables and by the Student's t-test for the continuous variables (tables 2 and 3). A logistic regression model for group status was fitted to estimate the effect of the patient characteristics such as age, gender, diagnosis, cohabitant status, employment and educational level (table 4).

Overview of relevant actions in connection with a consultation in general practice for patients after the screening for CV risk factors was compared between high- and low-risk patients by the Fisher's exact test (table 5).

For both outcomes, GPseen and GPseen with action, logistic regression analyses were used to investigate the influence of the patient characteristics; age, gender, diagnosis, living status, employment and educational level at the time of the screening consultation (tables 6 and 7, respectively). Both univariable and multivariable models were estimated. The multivariable model was also estimated stratified by risk group. No imputation of missing data was performed. All analyses were conducted at the two-sided 5% significance level using Stata 16 (Stata Corp. College Station, TX, USA).

RESULTS

Between July 2012 and July 2015, a total of 1369 patients with inflammatory arthritis (IA) aged 18–85 years had participated in at least one nurse-led CV screening consultation. One person was excluded due to the lack of a valid civil registration number. The 103 patients with known DM were excluded, whereas 187 patients with known CV disease were included, as they usually do not have regular follow-ups with their GP. Thus, 1265 patients were included in the analyses.

Table 1 Definition of high risk and low risk in this study

	High-risk	Low-risk
SCORE/mSCORE	≥5%	<5%
SBP	≥145 mmHg	<145 mmHg
Total cholesterol	≥8 mmol/L	<8 mmol/L
LDL cholesterol	≥5 mmol/L	<5 mmol/L
HbA1c	≥42 mmol/mol	<42 mmol/mol
FG*	≥6 mmol/L	<6 mmol/L

*FG was only considered if patients had no measure of HbA1c. Patients with known diabetes mellitus were excluded.
FG, fasting glucose; HbA1c, haemoglobin A1c; LDL, low-density lipoprotein; mSCORE, modified SCORE for patients with RA[8]; SBP, systolic blood pressure; SCORE, Systematic COronary Risk Evaluation.[16]

Table 2 CV risk factors, lifestyle factors and sociodemographic characteristics of the included population

	All n (%)	Low n (%)	High n (%)	P value
Total	1265 (100.0)	833 (100.0)	432 (100.0)	
Gender				0.01
Female	831 (65.7)	569 (68.3)	262 (60.6)	
Male	434 (34.3)	264 (31.7)	170 (39.4)	
Age (years)				<0.00
18–64	725 (57.3)	543 (65.2)	182 (42.1)	
≥65	540 (42.7)	290 (34.8)	250 (57.9)	
Diagnosis				0.00
RA	917 (72.5)	582 (69.9)	335 (77.5)	
SpA, AS or PsA	348 (27.5)	251 (30.1)	97 (22.5)	
Socioeconomic factors				
Cohabitant status				0.03
Alone	426 (33.7)	298 (35.8)	128 (29.6)	
With partner	839 (66.3)	535 (64.2)	304 (70.4)	
Employment				<0.05
No	802 (63.4)	482 (57.9)	320 (74.1)	
Yes	463 (36.6)	351 (42.1)	112 (25.9)	
Income				0.01
Low	254 (20.1)	150 (18.0)	104 (24.1)	
Middle and high	1011 (79.9)	683 (82.0)	328 (75.9)	
Educational level				0.01
Basic	449 (35.5)	274 (32.9)	175 (40.5)	
Higher	788 (62.3)	541 (64.9)	247 (57.2)	
Unknown	28 (2.2)	18 (2.2)	10 (2.3)	
Lifestyle and CV risk factors				
Alcohol intake above recommendations				0.10
No	979 (77.4)	648 (77.8)	331 (76.6)	
Yes	102 (8.1)	59 (7.1)	43 (10.0)	
Unknown	184 (14.5)	126 (15.1)	58 (13.4)	
Smoking				0.07
No	978 (77.3)	657 (78.9)	321 (74.3)	
Yes	287 (22.7)	176 (21.1)	111 (25.7)	
Exercise				0.46
Less than five times per week	419 (33.1)	270 (32.4)	149 (34.5)	
Five times or more per week	846 (66.9)	563 (67.6)	283 (65.5)	
Systolic blood pressure				<0.00
<145 mmHg	973 (76.9)	833 (100.0)	140 (32.4)	
145–159 mmHg	182 (14.4)		182 (42.1)	
≥160 mmHg	110 (8.7)		110 (25.5)	

Employment, main employment during the past 12 months prior to the screening visit: yes—employed, no—retired, unemployed and others; income, personal disposable income after taxation and interest: low—lowest third, and middle and high—highest two thirds; educational level, highest attained education categorised according to the International Standard Classification of Education[25]: basic—0–10 years of education, higher—above 10 years of education; Alcohol intake above recommendations, alcohol intake above National Health recommendations (maximum 7 units per week for women and 14 units per week for men).
AS, ankylosing spondylitis; CV, cardiovascular; PsA, psoriasis arthritis; RA, rheumatoid arthritis; SpA, spondyloarthritis.

Patient characteristics and SES
The demographic data and CV risk factors are shown in tables 2 and 3 for all patients, and separately for high- and low-risk patients. Among the screened patients, 432 were considered to be 'high-risk' according to the described definition and thus they had been recommended to contact their GP for a follow-up visit (table 2).

The high-risk group was characterised by more often being male, living alone, having a low educational level, having RA, to be retired or unemployed, over the age of 64 years and with low income. In the logistic regression model, this trend was evident, however, only significant for being male and age above 64 years in the adjusted analyses (table 4).

Table 3 Lifestyle and CV risk factors for the included population

	All (n)	Mean	SD	Low (n)	Mean	SD	High (n)	Mean	SD	P-value
Age (years)	1265	60.4	13.5	833	57.6	14.0	432	65.6	10.4	<0.00
SBP (mmHg)	1265	133.7	17.6	833	126.0	11.8	432	148.4	17.7	<0.00
HDL cholesterol (mmol/L)	1265	1.7	0.5	833	1.7	0.5	432	1.7	0.5	0.87
LDL cholesterol (mmol/L)	1240	3.1	0.9	816	3.0	0.8	424	3.4	1.1	<0.00
Total cholesterol (mmol/L)	1265	5.3	1.0	833	5.2	0.9	432	5.6	1.1	<0.00
SCORE (10 year risk (%))	686	1.4	1.9	505	0.8	1.0	181	2.9	2.7	<0.00
mSCORE (10 year risk (%))	427	1.7	2.3	308	0.9	1.1	119	3.6	3.4	<0.00
Waist circumference (cm)	1258	92.1	13.9	830	90.4	13.5	428	95.4	14.1	<0.00
BMI (kg/m^2)	1261	27.6	5.3	831	27.2	5.3	430	28.4	5.3	<0.00
HbA1c (mmol/mol)	525	35.5	4.8	364	34.4	3.9	161	37.8	5.7	<0.00
Fasting glucose (mmol/L)	961	5.5	0.8	611	5.3	0.5	350	5.8	1.1	<0.00

BMI, body mass index; HbA1c, haemoglobin A1c; HDL, high-density lipoprotein; LDL, low-density lipoprotein; mSCORE, modified SCORE for RA-patients[17]; SBP, systolic blood pressure; SCORE, Systematic COronary Risk Evaluation.[16]

Table 4 Influence of SES on being in the high-risk group

	N (%)	Crude		Adjusted	
		OR (95% CI)	P value	OR (95% CI)	P value
Gender			0.01		0.01
Female	262 (31.5)	1 (Ref)		1 (Ref)	
Male	170 (39.2)	1.40 (1.10 to 1.78)		1.44 (1.11 to 1.88)	
Age(years)			<0.00		<0.00
18–64	182 (25.1)	1 (Ref)		1 (Ref)	
≥65	250 (46.3)	2.57 (2.03 to 3.26)		2.07 (1.51 to 2.83)	
Diagnosis			0.00		0.33
RA	335 (36.5)	1 (Ref)		1 (Ref)	
SpA, AS or PsA	97 (27.9)	0.67 (0.51 to 0.88)		0.86 (0.64 to 1.16)	
Socioeconomic factors					
Cohabitant status			0.03		0.09
Alone	128 (30.0)	1 (Ref)		1 (Ref)	
With partner	304 (36.2)	1.32 (1.03 to 1.70)		1.26 (0.97 to 1.64)	
Employment			<0.00		0.11
No	320 (39.9)	1 (Ref)		1 (Ref)	
Yes	112 (24.2)	0.48 (0.37 to 0.62)		0.76 (0.55 to 1.06)	
Educational level			0.01		0.29
Basic educational level	175 (39.0)	1 (Ref)		1 (Ref)	
Higher educational level	257 (31.5)	0.72 (0.57 to 0.92)		0.87 (0.67 to 1.13)	

Employment, main employment during the past 12 months prior to the screening visit: yes—employed and No—retired, unemployed and others; educational level, highest attained education categorised according to the International Standard Classification of Education[25]: basic—0–10 years of education, higher—above 10 years of education.
AS, ankylosing spondylitis; PsA, psoriasis arthritis; RA, rheumatoid arthritis; SES, socioeconomic status; SpA, spondyloarthritis.

Consultation in general practice

To investigate whether patients in the high- and low-risk groups had an a priori difference in their use of general practice, we obtained information regarding consultation rates for both groups in the year prior to their first CV screening visit. High-risk patients had a mean (SD) 1-year consultation rate of 6.2 (4.2) compared to 6.4 (4.8) for the low-risk patients. Low educational level and low income increased the mean 1-year consultation rates

with no significant difference between high- and low-risk patients (data not shown).

In both high- and low-risk patients, approximately three-quarters of the patients had a consultation with their GP during the 6 weeks post-screening with no statistically significant difference. A GP consultation led to apparently relevant actions, for example, BP home measurement or initiation of treatment with statins, antihypertensives or antidiabetics in 124/325 (38%) of the

high-risk patients, and 152/590 (26%) of the low-risk patients, p<0.001 (table 5).

Female gender, age above 64 years, having RA, not working and basic educational level increased the odds of having a consultation for all patients in the crude analyses. In the adjusted analyses, the influence of the

diagnosis of RA, not working and basic educational level remained significant (table 6).

Consultations in general practice with relevant actions

The diagnosis of SpA, AS or PsA significantly increased the odds of having a consultation with a relevant action

Table 5 Overview of relevant actions in connection with a consultation in general practice for patients after screening for CV disease

	Low n (%)	High n (%)	P value
Total	833 (100)	432 (100)	
Consultation at general practice	590 (70.8)	325 (75.2)	0.10
Consultation+other blood samples	116 (13.9)	63 (14.6)	0.80
Consultation+BP home measurement	8 (1.0)	28 (6.5)	<0.00
Consultation+B-glucose	39 (4.7)	33 (7.6)	0,04
Consultation+first-time prescription* within 42 days of screening visit			
Statins	7 (0.8)	16 (3.7)	<0.00
Antihypertensives and antidiabetics	6 (0.7)	30 (6.9)	<0.00
Consultations with a relevant action	152 (18.2)	124 (28.7)	<0.00

*First-time prescription is defined as a prescription for a medication the patient did not receive in the last 6 months prior to the screening visit.
B-glucose, blood-glucose; BP, blood pressure; CV, cardiovascular.

Table 6 Influence of SES on having a consultation at general practice after the screening consultation for all patients

	GPseen n (%)	Crude		Adjusted	
		OR (95% CI)	P value	OR (95% CI)	P value
Total	1265				
Gender			0.02		0.18
Female	619 (74.5)	1 (Ref)		1 (Ref)	
Male	296 (68.2)	0.73 (0.57–0.95)		0.83 (0.63–1.09)	
Age (years)			<0.00		0.68
18–64	498 (68.7)	1 (Ref)		1 (Ref)	
≥65	417 (77.2)	1.55 (1.20–1.99)		1.07 (0.76–1.52)	
Diagnosis			<0.00		0.01
RA	693 (75.6)	1 (Ref)		1 (Ref)	
SpA, AS or PsA	222 (63.8)	0.57 (0.44–0.74)		0.68 (0.51–0.91)	
Socioeconomic factors					
Cohabitant status			0.36		0.46
Alone	315 (73.9)	1 (Ref)		1 (Ref)	
With partner	600 (71.5)	0.88 (0.68–1.15)		0.90 (0.68–1.18)	
Employment			<0.00		0.05
No	614 (76.6)	1 (Ref)		1 (Ref)	
Yes	301 (65.0)	0.57 (0.44–0.73)		0.72 (0.52–0.99)	
Educational level			<0.00		0.00
Basic educational level	357 (79.5)	1 (Ref)		1 (Ref)	
Higher educational level	558 (68.4)	0.56 (0.42–0.73)		0.66 (0.49–0.88)	
Group			0.10		0.37
Low-risk	590 (70.8)	1 (Ref)		1 (Ref)	
High-risk	325 (75.2)	1.25 (0.96–1.63)		1.14 (0.86–1.50)	

Employment, main employment during the past 12 months prior to the screening visit: yes—employed, no—retired, unemployed and others; educational level, highest attained education categorised according to the International Standard Classification of Education[25]: basic—0–10 years of education, higher—above 10 years of education.
AS, ankylosing spondylitis; PsA, psoriasis arthritis; RA, rheumatoid arthritis; SES, socioeconomic status; SpA, spondyloarthritis.

for all patients and in the stratified analyses for the low-risk patients compared to not having a consultation (table 7).

For the high-risk patients, higher educational level significantly decreased the odds of having a consultation with a relevant action (table 7).

DISCUSSION

Among the patients with high risk for CV disease, 75% visited general practice in the first 6 weeks post-screening. Among these, 38% had a consultation at their GP with a relevant action. This encompasses 29% of all the high-risk patients. Among the low-risk patients, 71% consulted their GP and among these, 18% received a relevant action in the first 6-weeks post-screening, so the difference between the high-risk and low-risk patients is smaller than one would have expected. This indicates that the patients under investigation visited their GP for several reasons. Unfortunately, we cannot see the reason why the low-risk patients consulted their GP based on the register data. It may be due to anxiety after the screening

consultation, because of other health problems, for regular blood tests, because of their treatment with antirheumatic drugs or because the screening consultation led them to consult their GP for support to adjust lifestyle factors, hence BMI, smoking or alcohol intake. A Dutch study involving 299 patients reported that, among their high-risk patients, only 16% were contacted by their GP and another 12% arranged an appointment themselves, after a similar screening consultation.[26] Thus, 24% with an indication for preventive treatment had a consultation with their GP, which is similar to our study.

In accordance with other studies, we found that low educational level and low income increased the mean 1-year consultation rates.[3 4] This indicates that patients' SES is of greater significance to whether they consult their GP than whether or not they have an increased CV risk. In the present study, it was not evident that poor SES increased the risk of non-adherence among the high-risk patients. This can partly be due to the fact that the high-risk patients represented a highly selected group. Patients with RA are known to have lower SES than the background population,[9] thus is appeared obvious to

Table 7 Influence of SES on having a consultation at general practice with a relevant action after the screening consultation for all patients

	All		Low-risk		High-risk	
	OR (95% CI)	P value	OR (95% CI)	P value	OR (95% CI)	P value
Total	1265		833		432	
Gender		0.78		0.66		0.40
Female	1 (Ref)		1 (Ref)		1 (Ref)	
Male	1.04 (0.78 to 1.40)		0.91 (0.61 to 1.36)		1.21 (0.78 to 1.90)	
Age(years)		0.72		0.68		0.69
18–64	1 (Ref)		1 (Ref)		1 (Ref)	
≥65	1.07 (0.75 to 1.52)		1.10 (0.69 to 1.78)		1.12 (0.65 to 1.93)	
Diagnosis		0.03		0.01		0.74
RA	1 (Ref)		1 (Ref)		1 (Ref)	
SpA, AS or PsA	1.41 (1.03 to 1.94)		1.66 (1.11 to 2.49)		1.09 (0.65 to 1.85)	
Socioeconomic factors						
Cohabitant status		0.34		0.19		0.74
Alone	1 (Ref)		1 (Ref)		1 (Ref)	
With partner	0.87 (0.65 to 1.16)		0.78 (0.54 to 1.13)		1.09 (0.67 to 1.76)	
Employment		0.46		0.32		0.86
No	1 (Ref)		1 (Ref)		1 (Ref)	
Yes	0.87 (0.61 to 1.25)		0.80 (0.51 to 1.25)		1.06 (0.57 to 1.95)	
Educational level		0.19		0.79		0.02
Basic educational level	1 (Ref)		1 (Ref)		1 (Ref)	
Higher educational level	0.82 (0.61 to 1.10)		1.05 (0.71 to 1.57)		0.58 (0.37 to 0.92)	
Group		<0.00				
Low-risk	1 (Ref)					
High-risk	1.81 (1.36 to 2.41)					

Employment, main employment during the past 12 months prior to the screening visit: yes—employed, no—retired, unemployed and others; educational level, highest attained education categorised according to the International Standard Classification of Education[25]: basic—0––10 years of education, higher—above 10 years of education.
AS, ankylosing spondylitis; PsA, psoriasis arthritis; RA, rheumatoid arthritis; SES, scioeconomic status; SpA, spondyloarthritis.

assume that the group of high-risk patients had lower SES compared to the patients with low CV risk (tables 1 and 2). However, the trend supported that theory, but the difference between high- and low-risk patients was not significant in the adjusted analyses (table 3). Nevertheless, the finding that, among patients with high CV risk, those with higher education were less likely than those with lower education to consult their GP was an unexpected finding in comparison to other studies regarding SES and non-participation[27–29] and studies regarding patients' adherence to preventive treatment.[30–33] Perhaps, those with a higher educational level might be more inclined to, for example, measure their BP at home or had previously tried home BP measurement revealing a normal BP. This group may also have resources to change their dietary and smoking habits, and thus only consult their GP if necessary.

Although it is the patient's responsibility to contact their GP, 25% of the high-risk patients did not do so, despite the recommendation. There may be several reasons for this. The literature reveals that patients find it difficult to understand the concept of risk[34 35] and find it difficult to relate to a new disease on top of their arthritis.[34] Furthermore, a person's beliefs and actions regarding their health seem to depend on what is valued in their specific social context and thus related to their SES.[36 37] Social status seems to affect health, by shaping individuals' lifestyles.[1 36] A person's health-related risk attitude also significantly influences their adherence to treatment.[38] When health professionals discuss lifestyle issues with a patient, it is therefore important that they try to understand the person's beliefs and thoughts regarding the importance of health issues and try to understand the context in which the patient lives.[36] A short screening consultation, like the one described in our study, addresses the detection of risk factors and only to a certain extent the individual's everyday life, values and concerns. The underlying social inequality, which shapes the patient's beliefs and actions, needs to be addressed by interventions at the societal level.[1]

According to the updated EULAR guidelines,[17] the responsibility for CV risk management lies with the rheumatologists, but they can choose to delegate this responsibility. In Denmark, the guideline for CV risk management in general practice was updated in 2019, and people with RA and psoriasis are now described as having increased risk, but other types of IA are not mentioned.[39] It is still uncertain how many GPs know that persons with IA have the same CV risk as persons with diabetes mellitus. An US qualitative study found that rheumatologists may assume that CV management is automatically offered by the GPs although half of the GPs and also half of the patients were not aware of the increased risk.[40] Systematic CV screening and management is still suboptimal in Europe.[26 41 42] In diabetes care, it has been shown that a multifactorial intervention with tight control, including treatment with multiple drugs and behaviour modification can reduce the mortality rate.[43 44] Despite this knowledge, numerous intervention studies and the increased awareness of the importance of this task, shared care and communication across sectors in diabetes care still need improvement.[45 46] Similar challenges have been found in the cancer field.[47 48] Thus, communication across sectors is still a major challenge and it is important to acknowledge this when planning shared care treatment. A close collaboration between primary and secondary care to improve CV risk management is needed, and inspiration for a successful implementation can be found in a Dutch study.[49] When GPs were asked to screen the lipid profile in patients with RA, they received a reminder letter if they had non-screened patients and it was checked again 6 months later. After this, 88% of the patients had been screened.[49] In Denmark, a copy of the note in the patient's journal is sent electronically to the patient's GP and a colour-coding system has recently been implemented to inform the GP whether he/she needs to take action and contact the patient after a hospital visit. This may improve care and ensure that high-risk patients get the needed follow-up and future research could investigate this. However, this is only possible if the patients give their consent, due to the Danish Law.

Strengths and limitations
The strength of our study is that we used Danish registries with a high level of comprehensiveness and a long follow-up period.[22] Habits regarding smoking, alcohol consumption and physical activity were the only self-reported measures and they were discussed during the screening consultations.

A limitation of the study is that we could not identify the specific GP consultations regarding follow-up after the CV screening, and thus had to develop a proxy measurement as the primary outcome. Only the services registered in the NHSR were eligible. The topic under discussion in the consultations could not be ascertained and, for example, BP measurements during the consultation with the GP were not registered in the NHSR. Thus, the actual number of patients who consulted their GP and had a relevant action was probably underestimated. To compensate for this, we compared the number of consultations in the year before the first screening consultation for the high-risk and the low-risk groups, and found no difference between the two groups.

Furthermore, as the screening consultations are part of normal clinical practice, non-participation was not registered. However, 10% of the patients invited to the screening consultations declined the offer during the first year, where we monitored the implementation rate.

In this study, we chose to include patients with known CVD even though they a priori have a high risk of new CV events. They may have a different context for understanding CV risk and interacting with health services and this may affect their tendency to consult the GP. If we had

a larger population, it would have been interesting to explore differences between patients with or without known CVD.

CONCLUSIONS

This study reveals that, among the 34% of the patients with high or very high risk for CV death within 10 years, 75% consulted their GP as recommended; 38% of these received an action relevant for their CV risk. The remaining 25% of the high-risk patients did not consult their GP at all in the 6 weeks following the CV screening consultation. Only education ≥10 years significantly increased the odds of non-adherence among the tested socioeconomic factors. Further research is needed to explore the patients' views on barriers to contact general practice and whether higher education impacts non-adherence for these patients.

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