Sex and gender differences in diabetes care

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Chapter 8

Evaluation of care in men and women with type 2 diabetes (ZODIAC-52)

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Abstract

Background
Little is known about the association between patient-related factors and patients' evaluation of care. Aim was to investigate which patient-related factors are associated with patients' evaluation of care in men and women with type 2 diabetes (T2D) in primary care.

Methods
This cross-sectional study included 1,102 patients with T2D from 52 general practices. We measured patients' evaluation with the EUROPEP questionnaire and collected demographic, clinical and psychological data from questionnaires and health records. Stepwise linear regression analyses were used.

Results
The location where the questionnaire was completed (at home or at the general practice) was associated with all outcomes in men and women. Next to this, in men, explanatory factors for the care provider EUROPEP subscale were the use of insulin, having some problems with DM self-care and coffee consumption (R^2 8.4%); coffee consumption was associated with the general practice subscale (R^2 3.6%). In women, well-being, quality of life, following a general diet, and use of oral glucose-lowering drugs were associated with the care provider subscale (R^2 16.8%). For the general practice subscale, well-being and age were explanatory factors (R^2 9.4%).

Conclusions
Only a few factors were found to be associated with patients' evaluation of care. Together, these factors explained only a small part of the variance of the EUROPEP scores. This explained variance was largely attributable to the location where the questionnaire was completed. We therefore advise to be aware of the possible consequences of filing-out questionnaires about patients' evaluation of care at the general practice.

Introduction

Patients' evaluation of delivered care is an increasingly important quality outcome of health care (1). In some countries, this evaluation already forms a regular part of the evaluation of care for patients with chronic diseases.
Variation in patient evaluations could reflect differences between the evaluated general practitioners (GPs) and practices, but it could also reflect differences between patients themselves (2). Knowledge of the extent to which patient characteristics are associated with variation in patient evaluations of care allows to account for these differences when comparing practice populations and GPs (2). Furthermore, insight into these factors may lead to a more positive patient experience.
Higher age, having a chronic disease, having a higher risk for cardiovascular diseases and a higher frequency of attendance are all patient-related factors associated with a more positive evaluation of care (2,3). Self-rated health shows conflicting results in relation to patients' evaluation of care (3,4).
In patients with type 2 diabetes mellitus (T2D), a higher HbA1c and receiving insulin therapy are described to be associated with a more positive evaluation (5,6).
Little is known about the extent to which patient-related factors are associated with patients' evaluation of care. One study, which was conducted in patients with osteoarthritis, described that 27% of the variance in patient evaluation could be explained by patient-related factors (7). The degree to which patient-related factors contribute to the prediction of evaluation of care in patients with T2D is unknown. Also, it is unknown whether there are gender-related differences. Women may base their judgment of delivered care on other factors compared to men, as in women emotions are more involved in the decision process compared to men (8). Consequently, the degree to which patient-related factors are associated with patients' evaluation of care could therefore be different between men and women. Therefore, the aim of the current study was to investigate which patient-related demographic, psychological and clinical factors are associated with patients' evaluation in T2D patients in primary care, with a focus on gender differences.

Methods

Study population and design

The current study was performed using baseline data from an observational prospective cohort study. The design and details of this study have been published previously (9). Briefly, this study was initiated with the primary aim to investigate the influence

of the use of an online care platform on the health-related quality of life (HRQoL) of patients with T2D treated in primary care. All patients with T2D in 52 general practices in the Drenthe region (the Netherlands) were asked by their practice nurses to fill out questionnaires including questions on HRQoL, well-being and degree of self-reliance. Additionally, all patients were given access to a care platform on the internet, which provided laboratory results based on the yearly check-ups, educational modules and a module to start a self-chosen process of lifestyle intervention through the platform. The use of this platform was entirely voluntary.

Questionnaires were filled out at the general practice on a tablet computer. Many patients experienced problems with this method during the first half of the inclusion period. Therefore, during the second half of the study period, patient could also fill out the questionnaires at home on paper.

Patients were included from May 2012 till September 2014. A total of 1,710 (42.9%) out of 3,988 patients, who were asked to participate, gave written informed consent. The final study sample consisted of 1,102 (64.4%) patients; see for more details the flowchart in figure 1.

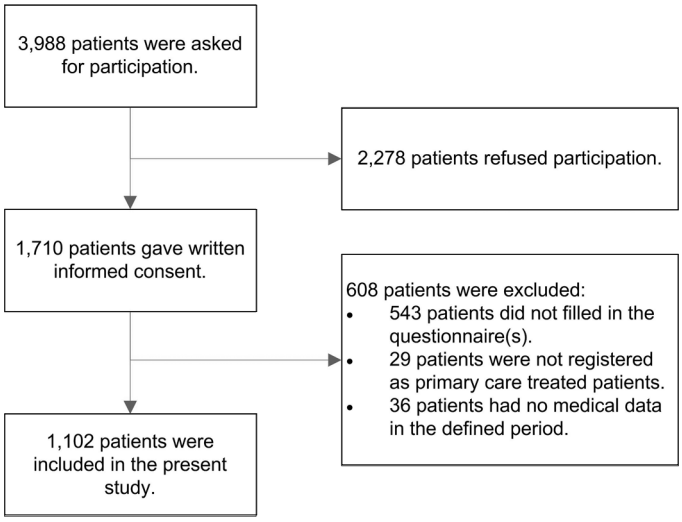

Figure 1. Flowchart of patient inclusion.

Patients' evaluation of care questionnaire

The European Task Force on Patient Evaluations of General Practice (EUROPEP) questionnaire was used to assess patients' evaluation of care (3,10). This internationally validated questionnaire contains 23 items, which measure different aspects of care. The patients respond to each item on a five-point Likert scale ranging from 'poor' to 'excellent' or by choosing for the category 'not applicable'. The EUROPEP questionnaire covers

two dimensions of care: a care provider evaluation (items 1–17) and a general practice evaluation (items 18–23) (3). In the current study, the mean scores of both dimensions were used. This questionnaire was filled out at baseline.

Survey data

Three months later, a range of validated questionnaires which measure the perceived quality of life (EQ-5D) (EQ-VAS) (11,12), well-being (WHO-5) (13), diabetes-related distress (PAID-5) (14) and self-reliance (SDSCA) (15) were filled out. For the EQ-5D, WHO-5 and the PAID-5 questionnaire, we calculated a sum score. For the SDSCA questionnaire the general diet, exercise and foot-care subscales scores were calculated and the individual items concerning full-fat dairy products and fruit and vegetables were used. Additionally, we collected information on daily occupation, education level, family history of cardiovascular diseases (CVD), smoking, alcohol consumption, coffee consumption, tea consumption, problems with diabetic self-care, concerns about hypoglycemia, attending psychological care and fall accidents.

We categorized daily occupation into having a job (full-time or part-time), being unemployed or incapacitated, being retired or being a housewife or –man; educational status as low, mediate or high; problems with diabetic self-care into: no, a little, some or huge problems; and concerns about hypoglycemia as: no, a little or huge concerns. For coffee and tea consumption we used a continuous scale. Smoking, alcohol consumption, attending psychological care and fall accidents were handled as dichotomous (yes/no) variables. We categorized the location where the questionnaire was completed into two groups; at the general practice or at home.

Health record data

We obtained clinical data and additional demographic data from the personal health record systems of the GPs. These data were collected during the annual check-up of the patients and were already routinely sent to our Diabetes Centre for benchmark and study purposes. Clinical data obtained in the period from 9 months before and 5 months after the EUROPEP questionnaire were used in this study. After informed consent of included patients, we combined these clinical data with the results of the collected questionnaires to assemble an anonymized dataset.

The following data were used in the current study: age, gender, duration of diabetes, BMI, HbA1c, systolic and diastolic blood pressure, total cholesterol, LDL-cholesterol, HDL-cholesterol, serum creatinine, the presence of microvascular complications, the presence of macrovascular complications and the use of glucose lowering, the use of lipid lowering and the use of antihypertensive medication. We defined the presence of microvascular complications as having diabetic retinopathy, albuminuria and/or diabetic peripheral neuropathy, and the presence of macrovascular complications as (a

history of) angina pectoris, myocardial infarction, percutaneous transluminal coronary angioplasty, coronary artery bypass grafting, stroke or transient ischemic attack or the use of thrombocyte aggregation inhibitors. Glucose lowering therapy was categorized into: diet, oral blood glucose lowering therapy and insulin therapy (with or without oral therapy).

Statistical analysis

Statistical analyses were performed using SPSS version 20 (IBM Corporation, Somers, NY, USA). We used multiple imputation for missing data on the independent variables, assuming that data was missing at random (MAR) or completely at random (MCAR). Ten imputated datasets were created. Baseline results are expressed as mean with standard deviation (SD) or median with interquartile range (IQR) for normally distributed and non-normally distributed data, respectively. Categorical variables are described in numbers and percentages. Differences were considered to be significant at a p-value of <0.05. A prediction model was built to find explanatory variables for the EUROPEP outcomes. For this, we entered all available parameters in stepwise linear regression models with the mean score of the two EUROPEP subscales as the dependent variables. We performed the analyses for the complete study population and for men and women separately. Final models are presented. The degree to which the models determined EUROPEP subscale scores was evaluated by the explained variance, shown as adjusted R^2. Before analyses, the presence of multicollinearity was tested between the WHO-5 and EQ-5D scores.

Results

Patient characteristics

Baseline results of the study population are described in table 1. Fifty-six percent of the patients were male. Mean age was 65.5 (SD 9.5) years in men and 63.9 (10.5) years in women. The median EUROPEP score for the evaluation of the care provider was 4.4 (IQR 4.0 – 4.9) in men and 4.5 (4.0 – 4.9) in women. The median EUROPEP score for the evaluation of the general practice was 4.2 (3.8 – 4.6) in men and 4.2 (3.8 – 4.7) in women.

Table 1. Baseline variables for men and women with type 2 diabetes.

Variables	Men	Women	p-value
N	616 (56)	486 (44)	
Age (years)	65.5 (±9.5)	63.9 (±10.5)	0.012
EUROPEP			
Care provider score	4.4 (4.0 – 4.9)	4.5 (4.0 – 4.9)	0.063
General practice score	4.2 (3.8 – 4.6)	4.2 (3.8 – 4.7)	0.832

WHO-5 sum score	76 (68 – 84)	72 (60 – 80)	<0.001
EQ-5D sum score	0.9 (0.8 – 1.0)	0.84 (0.78 – 1.00)	<0.001
EQ-VAS score	80 (70 – 90)	80 (61 – 88)	0.007
PAID-5 sum score	5 (0 – 15)	5 (0 – 20)	0.016
SDSCA items			
General diet	6 (5 – 7)	6 (5 – 7)	0.171
Fruit and vegetables	6 (5 – 7)	6 (5 – 7)	<0.001
Less Fat	5 (4 – 6)	6 (5 – 6)	<0.001
Exercise	4 (2.5 – 6.0)	4 (2.5 – 5.5)	0.728
Foot-care	1 (0 – 3.5)	1.5 (0 – 3.5)	0.060
Level of education			<0.001
Low	179 (29.1)	197 (40.5)	
Mediate	264 (42.9)	220 (45.3)	
High	173 (28.1)	69 (14.2)	
Occupation			<0.001
Job	176 (28.6)	116 (23.9)	
Retired	368 (59.7)	206 (42.4)	
Unemployed / incapacitated	61 (9.9)	38 (7.8)	
Housewife/-man	11 (1.8)	126 (25.9)	
Problems with DM self-care			0.683
No	390 (63.3)	313 (64.4)	
A little	160 (26.0)	131 (27.0)	
Some	45 (7.3)	26 (5.3)	
Huge	21 (3.4)	16 (3.3)	
Fall accidents	149 (24.2)	144 (29.6)	0.041
Vascular diseases in family	270 (43.8)	249 (51.2)	0.019
Contact with psychological caregivers	26 (4.2)	41 (8.4)	0.004
Worries about hypoglycaemia			0.052
No	457 (74.2)	328 (67.5)	
A little	98 (15.9)	91 (18.7)	
Huge	61 (9.9)	67 (13.8)	
Smoking	110 (17.9)	97 (20.0)	0.371
Alcohol usage	409 (66.4)	179 (36.8)	<0.001
Coffee usage	4 (3 – 6)	3 (2 – 4)	<0.001
Tea usage	2 (0 – 3)	2 (1 – 4)	<0.001
BMI (kg/m2)	28.7 (26.2 – 31.5)	29.6 (26.8 – 33.5)	<0.001
Diabetes duration (years)	6.8 (3.2 – 9.8)	6.8 (3.1 – 10.5)	0.436
HbA1c (mmol/mol)	49 (44 – 54)	48 (44 – 53)	0.605
Systolic blood pressure (mmHg)	136 (128 – 144)	132 (124 – 142)	0.009
Diastolic blood pressure (mmHg)	80 (70 – 84)	78 (70 – 82)	0.087
Cholesterol (mmol/L)	4.1 (3.6 – 4.8)	4.5 (3.9 – 5.1)	<0.001
HDL (mmol/L)	1.1 (1.0 – 1.3)	1.4 (1.2 – 1.6)	<0.001
LDL (mmol/L)	2.3 (1.8 – 2.8)	2.4 (1.9 – 3.0)	0.003
Creatinine (μmol/L)	85 (75 – 96)	68 (61 – 78)	<0.001
Microvascular complications	245 (39.8)	122 (25.1)	<0.001
Macrovascular complications	226 (36.7)	107 (22.0)	<0.001
Diabetes treatment			
Diet	105 (17.0)	101 (20.8)	0.114
Oral medication	426 (69.2)	313 (64.4)	0.096
Insulin use	85 (13.8)	72 (14.8)	0.632
Use of antihypertensive drugs	462 (75.0)	361 (74.3)	0.785
Use of lipid lowering drugs	499 (81.0)	361 (74.3)	0.007

Values are depicted as number (%), means (± SD) or median (IQR). Continuous data were analysed using independent t-tests or the Mann-Whitney U test. Categorical variables were analysed using chi square tests. Abbreviations: BMI: body mass index; HDL: high density lipoprotein; LDL: low density lipoprotein.

Variables associated with patient's evaluation of the care provider

In multivariable analyses of the complete study population, the location where the questionnaire was completed, well-being, and quality of life were associated with EUROPEP scores (table 2). The explained variance of this multivariate linear model was 10.4%. In men, explanatory variables were the location where the questionnaire was completed, the use of insulin, having some problems with DM self-care and coffee consumption (R^2 8.4%). In women, the location where the questionnaire was completed, well-being, quality of life, following a general diet, and the use of oral glucose lowering drugs were associated with EUROPEP outcomes (R^2 16.8%).

Variables associated with patient's evaluation of the general practice

Within the total study population, associations were observed with the location where the questionnaire was completed and well-being (Table 2, R^2 5.0%) for the general practice subscale of the EUROPEP. In men, the location where the questionnaire was completed and coffee consumption were associated with the evaluation of the general practice (R^2 3.6%). In women, the location where the questionnaire was completed, well-being and age were associated with the evaluation of the general practice (R^2 9.4%).

Location where the questionnaires were completed

We performed post-hoc analyses on the location where the questionnaires were completed. Figure 2 and 3 shows the distribution the EUROPEP mean scores for both subscales stratified to the location of completing the questionnaires. In all graphs, many high scores were observed in patients who filled out the questionnaire at the general practice.

In men who filled out the questionnaire at the general practice, the median EUROPEP scores for the care provider and general practice subgroups were 4.5 (4.1 – 4.9) and 4.3 (3.8 – 4.7), respectively. In men who filled out the questionnaires at home, the median EUROPEP scores for the care provider and general practice subgroups were 4.0 (3.8 – 4.6) and 4.0 (3.36 – 4.3), respectively.

In women who filled out the questionnaire at the general practice, the median EUROPEP scores for the care provider and general practice subgroups were 4.6 (4.1 – 5.0) and 4.3 (3.8 – 4.7) respectively. In women who filled out the questionnaires at home, the median EUROPEP scores for the care provider and general practice subgroups were 4.0 (3.8 – 4.6) and 4.0 (3.5 – 4.2), respectively.

Table 2. Factors associated with the EUROPEP score in men and women with type 2 diabetes.

Care provider evaluation‡	**Total population (1,102)** *Adjusted R^2(%) = 10.4 (8.5)** B (95%BI)	p-value	**Men (616)** *Adjusted R^2(%) = 8.4 (6.6)** B (95%BI)	p-value	**Women (486)** *Adjusted R^2(%) = 16.8 (10.9)** B (95%BI)	p-value
Location of completing questionnaire§	-0.377 (-0.450, -0.303)	<0.001	-0.330 (-0.425, -0.235)	<0.001	-0.448 (-0.560, -0.336)	<0.001
Well-being (WHO-5 sum score)	0.005 (0.003, 0.007)	<0.001	ns		0.007 (0.004, 0.010)	<0.001
Quality of life (EQ-5D sum score)	-0.325 (-0.525, -0.126)	0.001	ns		-0.340 (-0.630, -0.050)	0.022
Use of insulin	ns		0.135 (0.020, 0.250)	0.021	ns	
Some problems with DM self-care	ns		-0.138 (-0.338, -0.029)	0.020	ns	
Coffee consumption	ns		-0.018 (-0.033, -0.003)	0.022	ns	
General diet	ns		ns		0.034 (0.008, 0.061)	0.012
Use of oral glucose lowering drugs	ns		ns		0.098 (0.004, 0.192)	0.041
General practice evaluation‡	*Adjusted R^2(%) = 5.0 (3.2)** B (95%BI)	p-value	*Adjusted R^2(%) = 3.6 (2.6)** B (95%BI)	p-value	*Adjusted R^2(%) = 9.4 (3.8)** B (95%BI)	p-value
Location of completing questionnaire§	-0.273 (-0.361, -0.185)	<0.001	-0.246 (-0.360, -0.132)	<0.001	-0.329 (-0.463, -0.195)	<0.001
Well-being (WHO-5 sum score)	0.005 (0.003, 0.007)	<0.001	ns		0.007 (0.004, 0.010)	<0.001
Coffee consumption	ns		-0.030 (-0.048, -0.012)	0.001	ns	
Age	ns		ns		0.007 (0.002, 0.013)	0.004

* Adjusted R^2 for the models which only included the location where the questionnaire was completed. † Care provider subscale of the EUROPEP questionnaire. ‡ General practice subscale of the EUROPEP questionnaire. § Filled-out at home compared to filled-out at the general practice.

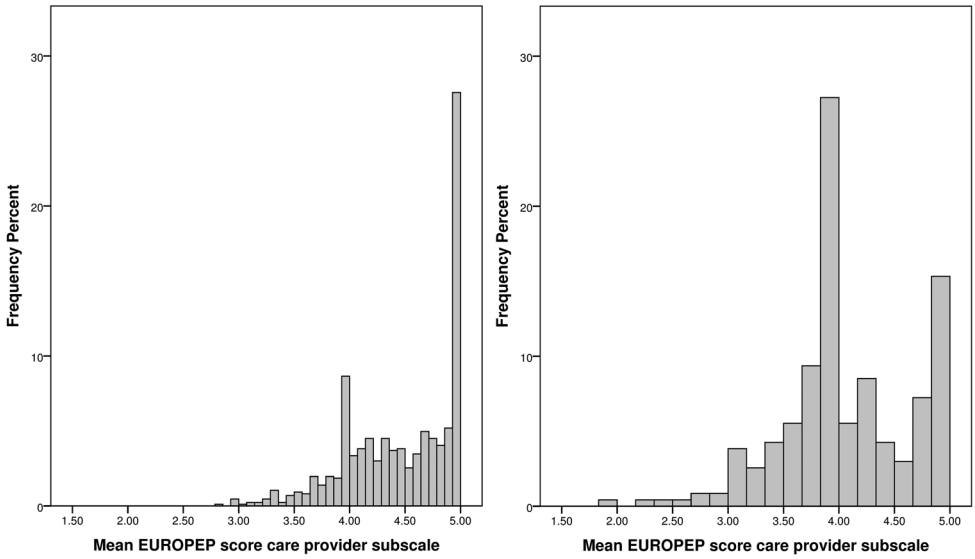

Figure 2. Distribution of EUROPEP scores for the care provider subscale for patients who have filled out the questionnaire at the general practice (left graph) or at home (right graph).

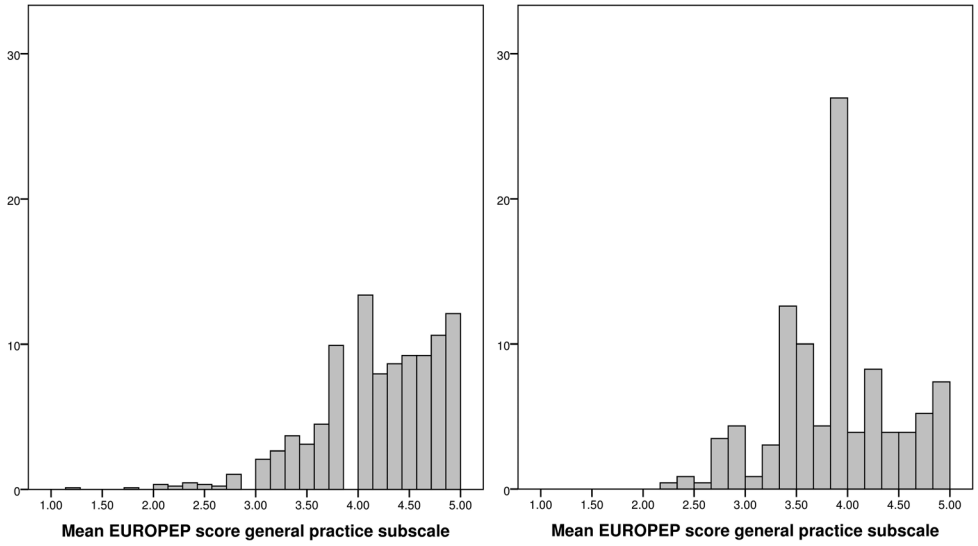

Figure 3. Distribution of EUROPEP scores for the general practice subscale for patients who have filled out the questionnaire at the general practice (left graph) or at home (right graph).

Discussion

Filling out the EUROPEP questionnaire at the general practice, a higher degree of well-being and a lower quality of life were associated with a better patient evaluation of care, as measured with the EUROPEP questionnaire in the total study population. In men, using insulin, not having some problems with diabetes self-care and less coffee consumption were associated with higher EUROPEP scores. In women, a higher degree of well-being, a lower quality of life, following a general diet, using of oral glucose lowering drugs and a higher age were associated with higher EUROPEP scores. However, the explained variance of these factors together was low in both genders. Besides this, the location where questionnaires were completed was a predominant factor in all analyses.

In the total population and in women, we found an association between a higher degree of well-being and higher EUROPEP scores on both subscales. This association was also found by Roseman et al. in patients with osteoarthritis (7). An association between a lower health-related quality of life with a higher EUROPEP score on the care provider subscale in the total population and in women was also observed in our study. No associations between well-being, health-related quality of life and EUROPEP scores were found in men. This may indicate that the evaluation of care is more influenced by personal feelings in women compared to men. The association between higher age and higher EUROPEP scores, as found in other studies (2,3,7), was confirmed only in women for the general practice subscale in the current study. The finding that the use of insulin is associated with a higher EUROPEP score on the care provider subscale is not in line with previous literature (5). The findings that less coffee consumption is associated with higher EUROPEP scores in men and that following a diet or using oral glucose lowering drugs are associated with higher EUROPEP score on the care provider subscale in women have not been described before.

Men and women, who have filled out the questionnaires at home, had approximately a 0.5 point lower median score on the care provider subscale and a 0.3 point lower median score on the general practice subscale compared to men and women who have filled out the questionnaires at the general practice. As almost all mean EUROPEP subscale scores ranged between 3 and 5, a difference of 0.5 is relevant. At the general practice, the questionnaires were filled out on a tablet computer. Some patients experienced practical problems with the use of these tablets and therefore they needed help. The presence of a care provider or assistant in the same room may have led to giving desired answers, also called the 'yes' saying bias. This is a culturally based tendency to agree with others, which is mostly seen in face-to-face interviews (16). The questionnaires filled out at home,

were directly sent to our Diabetes Centre without intervention of the care provider. These patients were possibly more honest about the received care as they knew that the care provider could not observe the answers. Furthermore, these patients probably did not experience time pressure, giving the respondents more time to think, which may have led to other responses (16). It should be mentioned that it was not our aim to investigate the influence of the location where the questionnaire was completed in particular. This finding should therefore be investigated in further research. Though, significant lower EUROPEP scores were found in the total population in the period when it was possible to fill out the questionnaire at home (data not shown). This finding strongly suggests a causal influence of the location where the questionnaire was filled out.

The fact that there were only a few patient-related factors associated with the EUROPEP scores and the low explained variance of these factors together, could indicate that patients' evaluation of care is not much depending on patient-related factors. However, some important patient-related factors were not taken into account. it may be that patients' evaluation of care is depending on the ability of patients to navigate through the healthcare system, their perceived self-efficacy and their motivation to play an active role in the care process. These aspects were not investigated in the present study. It may also be that the evaluation of care is more depending on the quality of the general practice and the behavior and character of the care provider. This seems to be especially the case in men, as the explained variance in men of all variables, except the location where the questionnaire was completed, was less than 5%. The low explained variance could also be the result of a ceiling effect. This has led to a restriction of range in EUROPEP scores. In such a homogeneous group it is hard to find predictive factors and there is not much variance that could be explained. It is certainly possible that this ceiling effect reflects reality, since patients in primary care in the Netherlands are quite satisfied with the delivered care (17).

It should be noticed that this study is a cross-sectional study and that no conclusions can be drawn about causality. Furthermore, due to the explorative character of our study all associations found could be a matter of coincidence and should therefore be tested in further studies. At last, the questionnaires were derived from a study with a primary aim to investigate the effect of e-Health on quality of life. Selection bias has occurred in this study as participants were more often men, younger and had a shorter duration of diabetes compared to non-participants (18). It is, however, unclear if this selection bias has influenced the results in the current study.

Conclusions

Only a few patient-related factors were found to be associated with T2D patients' evaluation of primary care and these factors together explained only a small part of the variance of the EUROPEP scores, especially in men. This explained variance was largely attributable to the location where the questionnaire was completed. We therefore advise to be aware of the possible consequences of filing-out questionnaires about patients' evaluation of care at the general practice.

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References

1. Richards T. Patients' priorities. BMJ. 1999 Jan 30;318(7179):277.
2. Heje HN, Vedsted P, Sokolowski I, Olesen F. Patient characteristics associated with differences in patients' evaluation of their general practitioner. BMC Health Serv Res. 2008;8:178.
3. Wensing M, Mainz J, Grol R. A standardised instrument for patient evaluations of general practice care in Europe. Eur J Gen Pract. 2000;(6):82–7.
4. Klemenc-Ketis Z, Petek D, Kersnik J. Association between family doctors' practices characteristics and patient evaluation of care. Health Policy Amst Neth. 2012 Aug;106(3):269–75.
5. Redekop WK, Koopmanschap MA, Stolk RP, Rutten GEHM, Wolffenbuttel BHR, Niessen LW. Health-related quality of life and treatment satisfaction in Dutch patients with type 2 diabetes. Diabetes Care. 2002 Mar;25(3):458–63.
6. Alazri MH, Neal RD. The association between satisfaction with services provided in primary care and outcomes in Type 2 diabetes mellitus. Diabet Med J Br Diabet Assoc. 2003 Jun;20(6):486–90.
7. Rosemann T, Wensing M, Szecsenyi J, Grol R. Satisfaction of osteoarthritis patients with provided care is not related to the disease-specific quality of life. J Eval Clin Pract. 2009 Jun;15(3):486–91.
8. Sanz de Acedo Lizárraga ML, Sanz de Acedo Baquedano MT, Cardelle-Elawar y M. Factors that affect decision making: gender and age differences. 2007;7(3):381–91.
9. Roelofsen Y, Hendriks SH, Sieverink F, van Vugt M, van Hateren KJ, Snoek FJ, et al. Design of the e-Vita diabetes mellitus study: effects and use of an interactive online care platform in patients with type 2 diabetes (e-VitaDM-1/ZODIAC-40). BMC Endocr Disord. 2014;14:22.
10. Grol R, Wensing M, Mainz J, Jung HP, Ferreira P, Hearnshaw H, et al. Patients in Europe evaluate general practice care: an international comparison. Br J Gen Pract J R Coll Gen Pract. 2000 Nov;50(460):882–7.
11. EuroQol Group. EuroQol--a new facility for the measurement of health-related quality of life. Health Policy Amst Neth. 1990 Dec;16(3):199–208.
12. Lamers LM, Stalmeier PFM, McDonnell J, Krabbe PFM, van Busschbach JJ. [Measuring the quality of life in economic evaluations: the Dutch EQ-5D tariff]. Ned Tijdschr Geneeskd. 2005 Jul 9;149(28):1574–8.
13. Topp CW, Østergaard SD, Søndergaard S, Bech P. The WHO-5 Well-Being Index: A Systematic Review of the Literature. Psychother Psychosom. 2015;84(3):167–76.
14. McGuire BE, Morrison TG, Hermanns N, Skovlund S, Eldrup E, Gagliardino J, et al. Short-form measures of diabetes-related emotional distress: the Problem Areas in Diabetes Scale (PAID)-5 and PAID-1. Diabetologia. 2010 Jan;53(1):66–9.
15. Toobert DJ, Hampson SE, Glasgow RE. The summary of diabetes self-care activities measure: results from 7 studies and a revised scale. Diabetes Care. 2000 Jul;23(7):943–50.
16. Bowling A. Mode of questionnaire administration can have serious effects on data quality. J Public Health Oxf Engl. 2005 Sep;27(3):281–91.
17. Brinkman BS, van Hateren KJJ, Kleefstra N, Houweling ST, Groenier KH, Bilo HJG. Effects of writing down the request for help: A randomized controlled trial. Eur J Gen Pract. 2013 Nov 13;
18. Roelofsen Y, Hendriks SH, Sieverink F, Landman GWD, Groenier KH, Bilo HJG, et al. Differences Between Patients With Type 2 Diabetes Mellitus Interested and Uninterested in the Use of a Patient Platform (e-VitaDM-2/ZODIAC-41). J Diabetes Sci Technol. 2014 Feb 21;8(2):230–7.