ORIGINAL ARTICLE

Self-reported cognitive and emotional effects and lifestyle changes shortly after preventive cardiovascular consultations in general practice

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Abstract

Objective. To describe patients' evaluation of the contents of preventive cardiovascular consultations and to analyse whether their evaluation is shaped by self-reported cognitive and emotional effects and lifestyle changes two to six weeks after the consultations. **Design.** Questionnaire developed by means of qualitative studies. **Setting.** Two counties in Denmark. **Subjects.** A total of 2450 subjects who had participated in a preventive cardiovascular consultation with their GP received a questionnaire; 1714 responded (70%); 1226 fulfilled the inclusion criteria, namely to be at increased risk of cardiovascular disease (CVD) but without having CVD. **Main outcome measures.** Cognitive and emotional effects and lifestyle changes. Odds ratios (ORs) were calculated between self-reported issues raised during the consultations and self-reported lifestyle changes, cognitive and emotional effects. **Results.** Some 58–79% reported cognitive effects (knowledge about risk and disease), 22–57% lifestyle changes (diet, exercise, and smoking), 80–97% emotional effects related to relief and satisfaction, and 23% worries. Those who reported that a dialogue had taken place (e.g. information concerning risk of disease, life habits, life circumstances/daily living, perception of risk, knowledge about disease, and own possibilities for prevention) had ORs between 1.7 and 4.3 for reporting three or more cognitive effects and one or more lifestyle changes ($p < 0.05$). These issues were also significantly related to emotional effects such as feeling relieved and satisfied. **Conclusion.** Patients report cognitive and emotional effects and healthy lifestyle changes following a cardiovascular preventive consultation and the magnitude of the effect is associated with the nature of the issues raised.

Key Words: Denmark, evaluation, family practice, general practice, preventive consultation, questionnaire study risk of CVD

In modern healthcare, the patient is no longer just a provider of case information and a recipient of healthcare services. Today's patient has become a partner in a joint decision-making process [1] and the emerging construct of patient-centred medicine awards the patient an active role in a concerted effort to improve overall care [2–8]. Furthermore, it has been demonstrated that screening involving health checks and consultations reduces the number of people at high risk of CVD [9] and has no negative long-term emotional effects on the patients, their healthcare utilisation and the overall costs of treatment [10–22].

In Denmark and many other countries, prevention has become a priority area in primary care in recent years. The year 2006 saw the introduction of a scheduled preventive consultation for people at increased risk of CVD together with a set of recommendations, published by the Danish College of General Practitioners, on which issues should be raised during individual prevention consultations and which risk-reduction strategies could be pursued [23]. However, it was also acknowledged that qualitative aspects [24] and the patients' evaluation of the effects of specific elements of the preventive consultations should be assessed to appraise fully the effect of

The most recent consultation guidelines for patients at increased risk of cardiovascular disease (CVD) published by the Danish College of General Practitioners (DSAM) in 2007 recommend GPs: to estimate total cardiovascular risk from fatal CVD within 10 years by using the SCORE system, to identify components of risk that are to be modified, to use the recommendations addressing the specific estimated risk of CVD, to use motivational interviewing, to adopt risk-handling strategies based on shared decision-making, and to schedule a follow-up consultation.

- Patients in preventive cardiovascular consultation report cognitive and emotional effects and lifestyle changes two to six weeks after the consultation.
- The cognitive and emotional effects and lifestyle changes increase if the consultation dialogue addresses risk of disease, life circumstances/daily living, perception of risk, knowledge of disease, and own possibilities for prevention.

preventive consultations. The aim of this study was to describe patients' evaluation of the contents of preventive cardiovascular consultations and to analyse whether their evaluation is shaped by self-reported cognitive and emotional effects and lifestyle changes two to six weeks after the consultations.

Material and methods

The health insurance register provided data on 2450 people who had a preventive cardiovascular consultation in February 2007. Among these, 1714 filled in a questionnaire (70.0%); 1226 fulfilled the inclusion criteria, namely to be at 5% or higher risk of fatal (death) CVD within 10 years by using the SCORE system [25]. Table I shows the characteristics of the study population.

The questionnaire consisted of three sections. Section 1 was related to patient, GP and consultation characteristics, the SF12 [26] and the questions were validated by DIKE [27]. Section 2 consisted of questions related to information about risk approaches, patient perspectives, motivation for changing lifestyle, emotional and cognitive effects, lifestyle changes, and satisfaction with the consultation. Section 2 was developed on the basis of results from a thematic analysis of 12 videotaped preventive cardiovascular consultations from general practice and grounded theory analysis of 12 individual interviews with the participating patients at increased risk of CVD [28]. Section 3 comprised two items from

Table I. Study population (n = 1226).

Study population	n	%
Gender		
Male/Female	652/574	53.2/46.8
Age		
20–50	231	18.8
51–60	348	28.4
61–75	558	45.5
76–99	89	7.3
Marital status		
Living with partner/single	998/226	81.5/18.5
Education		
Primary school	254	21.6
Short-term education	570	48.6
Middle-term education	265	22.6
Long-term education	85	7.2
Patient-reported number of risk factors ¹		
Low risk (1–2 risk factors)	432	36.9
Middle risk (3–4 risk factors)	480	41.0
High risk (5 or more risk factors)	258	22.1

Note: ¹Patient-reported risk factors related to the risk groups shown were based on the following nine questions: Are you a smoker? Are you overweight? Do you have high blood pressure? Do you suffer from diabetes? Do you have too high cholesterol? Are you physically active for at least half an hour per day? Do you think that your diet is unhealthy? Do you feel stressed on weekdays? Do your parents or siblings have or have they had cardiovascular disease?

COMRADE, a validated patient questionnaire to evaluate risk communication and decision-making effectiveness in general practice, respectively [29]. The questions from COMRADE were forward-and-backward translated into Danish [30].

The questionnaire was developed in accordance with the international recommendations and standards [30,31] and further developed and validated by observation of five patients filling in the questionnaire, by 14 general practitioners with research experience commenting on the questionnaire, and by sending the questionnaire to 200 patients at cardiovascular risk of whom 30 were subsequently telephone interviewed about their experiences with the questionnaire. The final questionnaire was mail-distributed two to four weeks after the preventive consultation and a reminder was sent two weeks later.

Exposure variables

Six different questions from the questionnaire were used as exposure variables (Table II):

1. Were you informed about your risk of disease during the consultation? Which of the following issues did you talk about during the consultation?
2. Your life circumstances/daily living?
3. Your own perception of risk for disease?
4. Your knowledge about disease?

5. Your possibilities for prevention of disease?
6. Did you talk about life habits?

Outcome variables

Three groups of questions were used as outcome variables and the response categories were dichotomized in order to analyse the data and to create sum scores (Table III).

Group 1 addressed the perception of cognitive effects: (1) knowledge about health, (2) priorities of health, (3) overview of health, (4) importance of lifestyle. A cognitive sum score was estimated by adding up the number of cognitive effects. Group 2 addressed lifestyle changes related to (1) diet, (2) physical activity, and (3) smoking in the weeks after the consultation. A lifestyle sum score was estimated by adding up the number of healthy lifestyle

Table II. Contents of preventive consultation as verified by questionnaires (n = 1226).

Questions to patients	Yes (n, %)	No (n, %)	Don't know (n, %)	Missing (n, %)
1. Were you informed about your risk of disease?	946 (79.4)	227 (19.0)	14 (1.2)	5 (0.4)
2. Were your life circumstances or daily living an issue?	806 (66.5)	354 (29.2)	40 (3.3)	12 (1.0)
3. Was your perception of risk for disease an issue?	598 (49.3)	505 (41.7)	99 (8.2)	10 (0.8)
4. Was your knowledge about disease an issue?	562 (46.4)	543 (44.8)	99 (8.15)	8 (0.65)
5. Were your own possibilities for preventing disease an issue?	271 (22.3)	903 (74.1)	39 (3.2)	5 (0.4)
6. Did you speak about life habits?	777 (64.5)	416 (34.5)	7 (0.6)	5 (0.4)

Table III. Prevalence of patient-reported cognitive and emotional effects and lifestyle changes following a preventive consultation (n = 1226).

Questions to patients (outcome variables)				
	“Highly agree” or “agree”		Missing	
	n	%	n	%
¹ Group 1 Cognitive effects				
1. You gained more knowledge about your health	957	78.8	12	1.0
2. You were more aware of your health	740	61.0	11	0.9
3. You had a better overview of your health	764	63.1	15	1.2
4. You have a better overview of the meaning of your life habits for your health	704	58.1	13	1.1
Cognitive sum score				
Participants reporting two or more cognitive benefits	501	41.6	23	2
Participants reporting three or more cognitive benefits	702	58.4	23	2
	“To a very large extent” or “to a large extent”		Missing	
	n	%	n	%
Group 2 Lifestyle changes ²				
1. I have changed dietary habits	690	56.7	9	0.7
2. I have changed physical activity habits	585	48.1	10	0.8
3. I have changed smoking habits	256	22.3	72	6.3
Lifestyle sum score				
Patient answering “not at all” or “to low degree” to all three questions	384	33.5	81	7.0
Patient answering “to some extent”, “agree” or “highly agree” to at least one of the three questions	761	66.5	81	7.0
	“Highly agree” or “agree”		Missing	
	n	%	n	%
Group 3 Emotional effects ¹				
1. You felt relieved	972	80.0	11	0.9
2. You felt worried	271	22.7	31	2.6
	“To a very large extent” or “to a large extent”			
	n	%	n	%
3. Are you satisfied with the consultation you have participated in ²	1193	97.4	1	0.1

Notes: ¹Response categories: “highly agree”, “agree”, “neutral”, “disagree”, and “highly disagree”. ²Response categories: “to a very large extent”, “to a large extent”, “to some extent”, “to a minor extent”, and “not at all”.

changes. Group 3 addressed emotional variables like (1) feeling of relief, (2) worries, and (3) satisfaction following the consultation.

Statistics

Crude and adjusted odds ratios (ORs) with 95% confidence intervals (CIs) were estimated by logistic regression between exposure and outcome variables (Table IV and V). We adjusted for age, sex, self-perceived physical and mental health, self-reported risk of CVD, marital status, and education. Possible effect modifications with sex, age, self-perceived mental health, patient-reported risk of CVD, marital status, and education were quantified by the introduction of interactions into the models. The hypotheses of no interaction were tested by Wald tests. The analysis was carried out using STATA 9.0 for windows. P-values (two-tailed) <0.05 were considered significant.

Results

The study population included slightly more men than women (see Table I). Their mean age was 61 years (range: 20–99). We found that 35 of the participating patients were older than 80 years and one was older than 90 years. Most patients were married and 70.2% had a short-term education. One to two cardiovascular risk factors were reported by 36.9%, three to four by 41.0%, and five or more by 22.1%. The non-responders did not deviate from the responders in terms of gender and age.

Main outcomes

The cognitive sum score showed that 58.4% had experienced three to four cognitive effects, and the lifestyle sum score that 66.5% had changed at least one lifestyle issue (see Table II). Furthermore, 97.4% felt satisfied, 80.0% relieved, and

22.7% worried following the consultation (see Table III).

Patients who reported having talked with their general practitioner about the issues mentioned in Table IV during the consultation more frequently reported three or more cognitive effects and one or more lifestyle changes than patients who did not report that these issues were raised (OR range 1.74–4.27, see Table IV). The adjusted ORs were all very similar and not significantly different from the crude ORs (data not shown).

Patients reporting being informed about risk of disease or that life habits had been addressed during the consultation were significantly less frequently relieved or worried than patients who reported that these issues had not been raised (OR 0.3–0.7, see Table V). Patients who reported having raised life circumstances/daily living, perception of risk, knowledge about disease, and their own preventive possibilities were significantly more often relieved (OR 1.61–2.50, see Table V) than patients who had not raised these issues. Patients reporting having raised each of the issues mentioned above and in Table V were significantly more often satisfied with the consultation than those who had not (OR 2.2–8.3). There was no significant difference between crude and adjusted ORs (data not shown). Introduction of interactions in the above-mentioned regression models (see Tables IV and V) did not significantly change any of the ORs (data not shown).

Discussion

Summary of principal findings

Patients reported cognitive and emotional effects and healthy lifestyle changes after cardiovascular preventive consultations, and the effects and changes were more pronounced if the issues raised included information on risk of disease, life circumstances/

Table IV. Logistic regression analysis of association between patient reporting three or more cognitive benefits and one or more lifestyle changes versus different issues talked about during preventive consultation.

Consultation issues below – exposure variables	Three or more cognitive effects (sum score, Table III)		One or more lifestyle changes (sum score, Table III)	
	OR crude (n)	95% CI	OR crude (n)	95% CI
1. Were you informed about your risk of disease? Yes versus no:	3.00 (1170)	2.2–4.0	3.64 (1183)	2.7–4.9
2. Were your life circumstances or daily living an issue? Yes versus no:	2.22 (1191)	1.7–2.8	2.00 (738)	1.6–2.5
3. Was your perception of risk of disease an issue? Yes versus no:	2.23 (1191)	1.8–2.8	1.79 (737)	1.4–2.3
4. Was your knowledge about disease an issue? Yes versus no:	1.93 (1191)	1.5–2.4	1.74 (737)	1.4–2.3
5. Were your own possibilities for prevention an issue? Yes versus no:	4.27 (1197)	3.2–5.6	2.42 (739)	1.8–3.2
6. Did you speak about life habits? Yes versus no:	2.20 (822)	1.7–2.8	4.15 (731)	3.2–5.4

Note: Crude odds ratios and 95% confidence intervals. Adjusted odd ratios did not differ significantly from crude ratios (data not shown).

Table V. Logistic regression analysis of association between relief, worries, and satisfaction versus different consultation issues talked about during consultation.

Consultation issues below – exposure variables	You felt relieved? Patients responding “highly agree” or “agree”			You felt worried? Patients responding “highly agree” or “agree”			Are you satisfied with the consultation? Patients responding “to a very large extent” or “to a large extent”		
	OR crude	95% CI	n	OR crude	95% CI	n	OR Crude	95 % CL	n
1. Were you informed about your risk of disease? Yes versus no	0.33	0.2–0.5	1181	0.64	0.4–0.9	1161	8.27	3.8–17.9	1191
2. Were your life circumstances or daily living an issue? Yes versus no	1.75	1.3–2.3	1046	0.84	0.6–1.1	1183	4.35	2.0–9–3	1210
3. Was your perception of risk of disease an issue? Yes versus no	2.50	1.9–2.5	1203	1.2 1	1.0–1.6	1183	4.18	1.7–10.3	1225
4. Was your knowledge about disease an issue? Yes versus no	2.06	1.5–2.8	1202	1.16	0.9–1.5	1184	2.16	0.99–4.7	1210
5. Were your own possibilities for prevention an issue? Yes versus no	1.61	1.2–2.2	1209	1.22	0.8–1.6	1189	7.45	3.4–16.4	1217
6. Did you speak about life habits? Yes versus no	0.47	0.4–0.6	1195	0.68	0.5–0.97	1032	3.41	1.6–7.2	1204

Note: Crude odds ratios and 95% confidence intervals. Adjusted odds ratios did not differ significantly from crude ratios (data not shown).

daily living, perception of risk, knowledge about disease, and possibilities for prevention.

This study was a cross-sectional study and we therefore cannot draw conclusions about causalities. Patients answered the questionnaire within two to six weeks after the consultations, and we therefore do not know the long-term effects of the consultation. The response rate to the questionnaire was acceptable (70.0%), and the number of patients was large enough to gain quite narrow CIs for the associations shown. The questionnaire was drawn up on the basis of results from patient interviews and videotaped consultations, which helped us to ensure a high level of face and content validity.

No statistically significant differences in age, gender, education, or self-rated health were found between the populations from the two counties. We could therefore merge the two without introducing bias. The questionnaire was sent out to all who had participated in a preventive consultation without an initial exclusion. This may have reduced the response rate if some of the patients were unable to respond, for instance if they did not read Danish.

The study may be hampered by recall bias as patients who experienced a high effect might have reported that more issues had been addressed during the consultation than patients who experienced a low effect. Information bias may also exist because some patients may have discussed preventive issues with their GP before the preventive consultation was introduced in general practice. The construction of the questionnaire and the non-restrictive inclusion

criteria make it likely that the results may be generalized to a broad range of general practice settings. We did not systematically control for confounding, but adjusted the ORs and found no significant differences.

Several studies have shown that a patient-centred consultation approach enjoys a number of advantages [32,33,34]. The present study underlines the importance of patient-centred information on risk, life habits, and other patient-relevant issues in preventive consultations and adds knowledge about the self-reported effects of such information shortly after preventive consultations. The present questionnaire may enjoy a higher validity than previously used questionnaires because it was based on qualitative triangulation research in general practice. Patient satisfaction studies in primary care generally report high assessment and satisfaction levels [34,35], which was also the case in our study (97.4%). Furthermore, satisfaction or agreement is generally higher with the overall than with the specific aspects of care, i.e. consultation elements [36,37], which our study also confirmed.

This study showed that patients who communicated about life habits and were informed of the risk of disease were less often relieved, but also less often worried after the consultation than patients who did not communicate about these issues during the consultation. These findings suggest that the patients' emotional reactions following a consultation are rather complex and that they are to some extent shaped by the general practitioners' and the patients'

choices of which elements to include in the consultation. In the light of the ongoing debate about the negative effects of primary prevention and screening, it could be interesting to explore the clinical consequences of being less relieved. For instance, it may have a positive effect on patients' readiness and ability to change lifestyle because some degree of reflection and the emotional effect of a preventive consultation seem to be an impetus for change and, therefore, to be beneficial.

Lifestyle changes were more frequently observed among patients who reported having had a dialogue with the GP about, for example, risk of disease and personal possibilities for prevention than among patients who had no such dialogues. However, some of the lifestyle changes could be small, e.g. consumption of less butter or smoking one fewer cigarette per day. The long-term consequences on health cannot be determined from the present study and long-term studies are therefore needed. A study demonstrated that preventive consultations reduced the number of people at high cardiovascular risk by 50% without increasing their worries and without causing a rise in the number of contacts with general practice and hospitals, including outpatient clinics, and without a rise in the associated cost [10–12,14,15,20].

The principal findings of this study can be utilized in the future development of and political debate about preventive consultations in general practice. This debate should also draw on studies addressing the implications for resource allocation and risk of medicalization and modelling studies estimating the target population for primary prevention of CVD [38,39].

Further research is needed to ascertain whether the cognitive and emotional effects and lifestyle changes remain stable in the long run, and to detect which consultation elements have the largest effect. We also need knowledge on how often patients may need to have preventive talks with their GP to maintain their lifestyle changes.

Ethical approval

According to the Scientific Committee for the County of Aarhus, Denmark, the Biomedical Research Ethics Committee System Act does not apply for this project. The study was approved by the Danish Data Protection Agency (j.no. 11 88 37 29).

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