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Experiences of doctors and nurses implementing nurse-delivered cardiovascular prevention in primary care: a qualitative study

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COMMENTS TO DECISION LETTER

Dear Editor,

Thank you for your invitation to submit a revised version of our manuscript and for the comment that the paper does only need minor revision. Revisions in the manuscript are marked with red.

1. The point by the reviewer on semi-structured interviews is well made. You need to correct the text to make it apparent in the one to one interviews that they were semi-structured.

That is correct. We have changed this in the revised version.

2. My previous point 7, still needs to be addresses. Include key references to support the methods of data collection.

References to support the methods of data collection are included in the revised version.

3. In the abstract, Conclusion - last sentence clarify meaningbecause of the support of ? or with the support of general practitioners? Check meaning and use best expression.

This comment is clear; we have changed this sentence.

4. page 13, line 21.....to each others' tasks and targets.

We decided to delete this sentence because this is already expressed in next sentences (barriers).

5. You still need to indent substantive direct quotes that are longer than one sentence in the text. e.g. page 14, lines 18-25; page 16 lines 40-44; 49-51; 57-60. See current versions of JAN how to do this.

We have changed this in the revised version. Some quotes are still short. Should we remove these?

6. page 16, line 29.....their numbers or results (e.g.....)

We have changed this sentence.

7. In the discussion, make explicit how the findings of your study advance knowldege, what is known.

We have made this more explicit.

- Comments to the Author. Thank you for addressing the editor and reviewer comments. The literature review has been strengthened and the description of the parent study has been separated from the interview study. The data collection methods are now explicit, though the related sections could be more firmly underpinned with references to the research literature.

Yes indeed. We have included some more references on this.

- A topic guide has been provided for the questionnaires (box1) however this implies a semi-structured interview format, rather than the 'structured interview' described on p.6, line 10.

That is correct. We have changed this in the revised version.

- The limitations have been separated from the main discussion which enhances clarity. The need for further research is mentioned (p.20 line 4-5) but this looks a bit like an afterthought and the author might have considered how best the stated limitations of his/her own research (biased sample and further bias in research personnel) could be countered in future research in the area.

Thank you for making this comment. We have added more on this Discussion of results.

We hope that the answers to the comments are satisfactory and that the manuscript is acceptable for publication in your journal in its present form.

On behalf of the co-authors,

Yours sincerely,

Anonymous

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3 Experiences of doctors and nurses implementing nurse-delivered cardiovascular
4 prevention in primary care: a qualitative study
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8 9 ABSTRACT 10

11 12 13 Aim

14
15 This paper reports on a study of the experiences of general practitioners and practice
16 nurses implementing nurse-delivered cardiovascular prevention to high risk patients in
17 primary care.
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22 23 24 Background

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26 Difficulties may arise when innovations are introduced into routine daily practice.
27
28 Whether or not implementation is successful is determined by different factors related
29 to caregivers, patients, type of innovation and context.
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34 35 36 Methods

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38 A qualitative study nested within a randomised trial (2006-2008) to evaluate the
39 effectiveness of nurse-delivered cardiovascular prevention. Six primary health care
40 centres in the Netherlands (25 general practitioners, 6 practice nurses) participated in
41 the trial. Interviews were held on two occasions: at three and at 18 months after
42 commencement of consultation. The first occasion was a group interview with six
43 practice nurses. The second consisted of semi-structured interviews with one general
44 practitioner and one practice nurse from each centre.
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53 54 55 Findings

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57 Main barriers to the implementation included: lack of knowledge about the guideline,
58 attitudes towards treatment targets, lack of communication, insufficient coaching by
59 doctors, content of life style advice. At the start of the consultation project, practice
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3 nurses expressed concern of losing nursing tasks. Other barriers were related to
4
5 patients (lack of motivation), the guideline (target population) and organisational issues
6
7 (insufficient patient recording and computer systems).
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10 11 Conclusions

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13 Both general practitioners and practice nurses were positive about nurse-delivered
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15 cardiovascular prevention in primary care. Nurses could play an important role in
16
17 successive removal of barriers to implementation of cardiovascular prevention.
18
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20 **Mutual confidence between care providers in the health care team is necessary.**
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22

23 24 25 Keywords

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27 Cardiovascular prevention; implementation; nursing; primary care; general
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29 practitioners; adherence.
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SUMMARY

What is already known about this topic

- * Difficulties may arise when innovations are introduced into routine daily practice.
- * Cardiovascular prevention in general practice is still not optimal
- * Involvement of nurses may improve the implementation of cardiovascular prevention.

What this paper adds

- * Nurses were found to be important facilitators of the implementation of cardiovascular prevention in the health care centres
- * Mutual confidence between care providers in the health care team is necessary for nurses to play this role.

Implication for practice and/or policy

- * Nurses have a definite role in assisting general practitioners to improve cardiovascular prevention in the health care centres.
- * Nevertheless, there is room for quality improvement.

INTRODUCTION

Difficulties may arise when clinical guidelines and innovations are introduced into routine daily practice. Whether or not implementation is successful is determined by different factors related to caregivers, patients, the innovation and the organisational and financial system (Grol et al. 2005). The implementation of any innovation demands effective communication and the removal of hindrances (Davis and Taylor-Vaisey 1997). Studies have shown that nurse-led clinics are more successful in the implementation of guidelines (Shaffer and Wexler 1995, Thomas et al. 2000). Guideline-driven care can be effective in changing the process and outcome of care provided by professions allied to medicine. (Thomas et al. 2000). However, more research on implementation in the area of nursing is needed. Implementation of evidence-based interventions is crucial to professional nursing and the quality and safety of patient care (van Achterberg et al. 2008). The study reported here is a contribution to this research; it comprises an evaluation of the experiences of caregivers with the implementation of a nurse-led cardiovascular prevention consultation in general practice and its underlying guideline (i.e. the intervention). It was conducted in the Netherlands and data were collected between 2006 and 2008. Although experiences of caregivers with implementation of nurse-led interventions will be different across health care settings, the findings remain relevant to evolving international knowledge in nursing science.

BACKGROUND

Concerning cardiovascular prevention, studies in primary care where the majority of high risk patients should be treated for cardiovascular risk factors have reported considerable potential to further increase the quality of care (Wood et al. 2008, Kotseva et al. 2009). Improvement of adherence to guidelines on cardiovascular prevention by caregivers and patient compliance to lifestyle advice and prescribed treatment is therefore still necessary (EUROASPIRE 2001, Penning-van Beest et al. 2007).

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3 Studies have shown that nurses can contribute to improvement of cardiovascular
4 prevention (Clark et al. 2010, Khunti et al. 2007). Nurses tend to be more compliant to
5 guidelines than doctors (Hulscher et al. 1997). The authors conducted a randomised
6 trial on the clinical effectiveness of nurse-delivered cardiovascular prevention to high-
7 risk patients in primary care (Voogdt-Pruis HR et al. 2010). Six primary health care
8 centres in the Netherlands (25 general practitioners, 6 practice nurses) participated.
9 The trial population consisted of 701 patients aged 30–74 years, with at least a 10%
10 10-year risk of fatal CVD according to the SCORE (Systematic Coronary Risk
11 Evaluation) risk function (Conroy et al. 2003). Of the included patients, 91% had
12 already been diagnosed with cardiovascular diseases. Randomization at the patient
13 level resulted in half of the patients to receive nurse-delivered care and the other half
14 standard care by general practitioners. Our qualitative study also reports on prevention
15 to patients at lower risk. Although these patients were excluded from the trial
16 population, they still received treatment according to the Dutch guideline (CBO and
17 NHG 2006). The multi-disciplinary Dutch guideline on cardiovascular prevention, which
18 was introduced just before starting the trial, was used as protocol for this trial (CBO and
19 NHG 2006). Information about the process of implementation is useful because it can
20 add value to existing data about quantitative effectiveness. Qualitative studies can
21 reveal which factors determine the implementation of nurse-delivered prevention and
22 show which role practice nurses and general practitioners play in the implementation
23 (Pope et al. 2002, Hulscher et al. 2003). The implementation-model described by Grol
24 et al. (Grol and Grimshaw 2003, Peters et al. 2003, Grol et al. 2005) was used as
25 conceptual model.
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THE STUDY

Aim

The aim of the study was to examine the experiences (barriers and facilitators) of general practitioners (GPs) and practice nurses implementing nurse-delivered cardiovascular prevention in primary care between 2006 and 2008.

Design

Interviews with GPs and practice nurses were conducted within a randomised trial examining the effectiveness of nurse-delivered cardiovascular prevention at primary care level (Pope et al. 2002, Lambert and Loiselle 2008). Six primary health care centres in the Netherlands (25 GPs, 6 practice nurses) participated in the trial. Interviews were held on two occasions during the period 2006 to 2008.

Participants

Six practice nurses participating in the trial (i.e. the intervention group) joined the first group interview. Standard care was given by GPs, hence no group interview was held with GPs. After completion of the trial, **semi-structured** interviews were held with all six practice nurses and with one GP from every centre (six GPs in total, of all 25 GPs). The GP who was the main supervisor of the practice nurse in the health care centre was interviewed. This was done in order to gain insight into the level of cooperation between the general practitioner and the practice nurse from the perspective of both caregivers.

Data collection

Interviews were held 3 and 18 months after the start of the nurse-led prevention programme. The first interview at 3 months started with the interview lasting one hour and a half. For this group interview, practice nurses were asked to write down all their

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2
3 negative and positive experiences of prevention consultation. These experiences were
4
5 then discussed in the whole group. Interviews were held without the presence of the
6
7 general practitioners.
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10 For the second round of interviews, after completion of the trial, semi-structured
11
12 interviews were held with the practice nurse and one GP from every centre, at the
13
14 health care centre. Two different questionnaires with overlapping questions were used,
15
16 one for GPs and one for practice nurses. The questions were derived from the
17
18 'implementation model' based on that described by Grol et al. (Grol and Grimshaw
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20 2003, Peters et al. 2003, Grol et al. 2005), from the group interview with practice
21
22 nurses, and from an explorative study on the feasibility of nurse-led cardiovascular
23
24 prevention (Leenders et al. 2006). Mainly open-ended questions were used. Topics for
25
26 the questionnaire are listed in box 1. Again, the interviewees had to write down their
27
28 answers first and explained these afterwards to the researcher (HV). This method was
29
30 chosen in order to give participants more time to think about the questions asked, to
31
32 challenge them to describe the situation succinctly, and to minimise interpersonal
33
34 interaction (Sudman et al. 1996, Lambert and Loiselle 2008). The second part of the
35
36 interview, in which answers were discussed, provided interviewees with the opportunity
37
38 to clarify their answers. All interviews were audio taped, transcribed verbatim by a
39
40 research assistant and checked by the researcher. All interviews were held by an
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42 experienced interviewer (HV) who was also a member of the research team.
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49 Ethical considerations

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51 The Medical Ethical Committee of the University agreed to the research being
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53 implemented (reference: METC/A06–007). For all interviews, it was emphasised that
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55 any individual answers from individual participants would not be communicated to the
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57 other caregivers.
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Data analysis

A qualitative content analysis with a directed approach was used (Mayring 2000, Graneheim and Lundman 2004, Hsieh and Shannon 2005). Themes were derived from the implementation-model described by Grol et al. (Grol and Grimshaw 2003, Peters et al. 2003, Grol et al. 2005). Two researchers (HV, GB) analysed the transcript independently of each other. Themes were allocated to all negative and positive fragments of the transcript. The two researchers compared their results and agreed to use two sub-themes for 'Caregiver' within this model: 'Job description of caregivers' and 'Communication between caregivers' to make a distinction between the different roles of GPs, practice nurses and other professionals within nurse-led cardiovascular prevention and to describe the collaboration. Furthermore, the other themes 'Guideline', 'Patient' and 'Context and organisation' from the model were used. The transcript was analysed again by one researcher (HV).

Validity and reliability

In order to improve consistency and reliability and to minimise bias, the analysis was checked and discussed with all authors, and categories were formulated. To illustrate the findings quotations are given, translated into English. These quotations were chosen with the agreement of all authors.

RESULTS

Six nurses and an equal number of GPs were interviewed. Five out of 6 practice nurses were female and the majority had several years of work experience. In contrast 2 out of 6 GPs were male, but they were similar regarding age. Three had a specific interest in cardiovascular diseases. (Table 1).

Job description of caregivers

The job description for practice nurses and GPs was based on the guideline. According to GPs, practice nurses had enough knowledge about cardiovascular diseases to carry out prevention consultation to a good standard. Practice nurses regarded themselves as responsible for giving lifestyle advice, monitoring risk, and checking for potential cardiovascular problems. GPs perceived themselves to be responsible for thorough medical examination and medical treatment. Practice nurses were satisfied with their job; 'valuable' (P2, P4, P6), 'educational' (P1, P3) and 'challenging' (P1, P5). All but one GP thought practice nurses referred patients to them on time. GPs' reasons for referral to specialists were: difficulty with normalising blood pressure or lipids, worsening of symptoms or development of new symptoms, and because of an acute event. The following barriers concerning job description were mentioned (Table 2):

At the start of prevention consultation, practice nurses had to alert GPs to the guideline. *'I noticed that the GPs were not so strict in keeping the guideline. They accepted higher levels of risk factors'* (P4). One practice nurse regarded this as her responsibility *'GPs have to keep to so many different guidelines. They have the luxury that the practice nurse makes them aware of these'* (P1). In addition to this, it became apparent that caregivers had different attitudes towards treatment targets. *'It's important that GPs are all in agreement, otherwise similar blood test results would then be interpreted differently'* (P3). Some practice nurses stated that at first they had a fear of losing nursing tasks. They also questioned the limits of diet and exercise intervention. *'I'm not really up to date with how much exercise a patient can do after an*

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3 *infarction. What do I need to examine? How do i know his exercise capacity?*

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5 (P3). Furthermore, practice nurses experienced a lack of ability to implement 'stop-
6 smoking' treatment well. As consultations continued, practice nurses said they needed
7 more medical background to improve cardiovascular consultation. One GP noticed that
8 *'Some practice nurses were community nurses in the past. They are not really trained*
9 *in counselling. How do you approach patients, motivate them into good behaviour? ...*
10 *good counselling is essential'* (G4). More difficulties with job description were
11 experienced within shared care. *'It is not clear which patients are treated by a*
12 *cardiologist. If a patient gets a heart attack, he will be treated by a specialised nurse. I*
13 *will treat them eventually, but when will that be? ... Job responsibilities should be made*
14 *more clear'* (P6).
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29 Communication between caregivers

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31 In all but one centre, every week or every two weeks practice nurses had regular
32 meetings with the GP to discuss their patients. Initially all the patients were discussed
33 but after a while, discussions were focussed on patients with problems. They talked
34 about medication, elevated risk factors and new or worsening symptoms. Besides the
35 regular meetings, practice nurses and GPs communicated by e-mail, telephone or had
36 'corridor discussions', which were initiated by practice nurses. According to practice
37 nurses, GPs were always available to answer questions.
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46 GPs stated that practice nurses communicated 'well' with them, without taking too
47 much time. They both stated that mutual appointments were kept. In most centres, one
48 GP was the contact person for the practice nurse although in special cases the practice
49 nurse would also communicate with other GPs. GPs were confident in the practice
50 nurse and this was also perceived by practice nurses. In all but one centre, referral to
51 other caregivers such as a dietician or a physiotherapist was always supervised by the
52 GP.
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3 The following barriers concerning job description were mentioned: Before commencing
4 consultation, little communication between GPs about the guideline was apparent. In
5 addition to this, GPs did not know how to structure communication between the
6 practice nurse and other GPs in daily practice. Although communication between GP
7 and practice nurse went well, they both lacked communication about practice nurses'
8 performance. With regard to patients' referral from practice nurse to GP, one GP
9 suggested creating a checklist. *'It is good to agree in advance what would give cause*
10 *for alarm. Perhaps there are times when it is less evident'* (G6). Practice nurses
11 wondered with whom to communicate in the case of a patient visiting a specialist.
12 Some practice nurses gave patients messages for the specialist whereas others only
13 communicated with the GP. Besides this, practice nurses noticed a lack of
14 communication between specialists and GPs.

31 Guideline on cardiovascular prevention

32
33 GPs and practice nurses had a positive attitude towards the guideline. They fully
34 agreed with the following characteristics of the guideline; 'evidence-based', 'positive
35 results', 'clearly written'. Benefits listed were structural check-ups, target orientated
36 treatment, better compliance and adherence, and the diagnosis of new diabetics. GPs
37 did agree with the statement that nurses are necessary for the management of
38 cardiovascular prevention. Practice nurses became familiar with the consultation
39 quickly. Acquiring new knowledge of medication and its complications required more
40 effort. GPs who had a special interest in cardiovascular disease were more aware of
41 lipid treatment targets.

42
43 Some GPs and practice nurses experienced difficulty in following the guideline in the
44 instance of a patient with a low risk profile but with a high blood pressure. They would
45 adhere to the old guideline for hypertension. Furthermore, practice nurses had different
46 opinions about guideline implementation within the secondary prevention group. *'I start*
47 *from step one; in case a patient has a blood pressure of 140, a new appointment for*
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3 *measurement of blood pressure will be made. That blood pressure must come down.'*
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5 (P1), *'I'm acting in a different way; i don't make another appointment because the*
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7 *patient has already received treatment'* (P6). Caregivers stated that limitation of task or
8
9 patient group is necessary when starting consultations. The guideline should be
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11 implemented gradually. One GP stated *'A couple of years ago, a blood pressure of*
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13 *160/90 was okay, but now the targets are so strict. So many people will receive*
14
15 *medication, for such a long time'* (G3). Practice nurses also hesitated to consult older
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17 patients. Surprisingly, in contrast to practice nurses, GPs said they often used
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19 motivational interviewing and shared decision making within consultations. Practice
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21 nurses perceived motivational interviewing as time consuming and sometimes difficult
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23 to apply.
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29 Patients

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31 According to caregivers, patients were aware of the benefits of cardiovascular
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33 prevention and they were motivated to visit for consultation. Patients *like to know blood*
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35 *test results*. Nevertheless, it took considerable effort to invite patients to attend for risk
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37 assessment. According to practice nurses, one third did not respond to the invitation
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39 letter or could not even be contacted by telephone.
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41 It generally proved to be difficult to motivate patients who rarely visited the practice. *'A*
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43 *negative aspect is the 'No show'. That is really a problem. I continuously have to check*
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45 *whether a patient has visited me'* (P4). Some patients lacked motivation to attend for
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47 follow-up and some refused to change their lifestyle. *'A few patients visit for*
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49 *consultation, but make no changes at all in their own lifestyle. Maybe they even*
50
51 *actually think coming to us is like a kind of little trip out'* (P1). Practice nurses noticed
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53 that they had to be careful with smokers and overweight patients; they needed more
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55 motivation. *'I constantly need to explain why it is so important to lose weight. The*
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57 *problem is that patients do not immediately see results'* (P5). It was better not to
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59 mention smoking at all in the invitation letter. Even patients with low risk profile and
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3 patients who did not experience immediate benefit from preventative treatment needed
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5 motivation and should be encouraged to attend for follow-up. *'Being weighed is the one*
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7 *thing they particularly hate. So I firstly try to get their confidence in me'* (P2). At the
8
9 start, patients who also visited a specialist questioned the reason for visiting the
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11 practice nurse.
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16 Context and Organisation

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18 Initially, a group of 30-40 patients were invited for risk assessment in order to avoid the
19
20 problem of many patients visiting the centre at the same time. A barrier to invitation for
21
22 risk assessment was poor record keeping about smoking behaviour, diagnoses, and
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24 treatment by specialist. Extending clinic opening hours after 5 pm would make it easier
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26 for patients to attend, particularly those in employment. According to practice nurses,
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28 practice assistants could also be involved in inviting patients but should be able to
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30 motivate patients as well. At one centre, practice assistants were involved in the
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32 measurement of blood pressure. Most practice nurses used an electronic
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34 cardiovascular risk card within the GP's electronic patient record, which proved to be a
35
36 helpful tool. Some practice nurses lacked the ability to register special circumstances
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38 or treatment. In addition, both practice nurses and GPs would like to have the risk
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40 score calculated automatically.
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44 The lack of physical space limited one centre to continue the implementation of nurse-
45
46 delivered cardiovascular prevention. GPs indicated that for better cooperation within
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48 shared care, it would be desirable to implement a chain of care and an integrated
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50 electronic patient record system.
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DISCUSSION

Limitations

In this qualitative study, we examined the experiences of GPs and nurses implementing nurse-delivered cardiovascular prevention in general practice. The findings should be read with some considerations. Firstly, the findings might be biased because self-reported answers were used (recall bias and social desirability bias). In addition, the interviewer who belonged to the research team, could also have influenced the results in a positive way (social desirability bias) (Adams et al. 1999). Secondly, our nurses had extensive work experience, although they had not specialised in heart disease prevention. It is nevertheless possible that the practice nurses in our study were more successful in the implementation of nurse-led cardiovascular prevention consultation compared to others, since they were aware that their performance was being assessed (i.e. Hawthorne effect). Implementation can be less effective among less experienced or less committed nurses (Thomas et al. 2000). In addition to this, half of the 6 interviewed GPs had a special interest in cardiovascular diseases. These positive attitudes promote effective implementation (Grol et al. 2005, van Achterberg et al. 2008). Thirdly, the group interview with all the nurses 3 months after commencing the project may have facilitated the implementation process. By that time, no group interview with GPs was held in order to avoid influencing standard GP care within our trial. However, we combined several methodologies to study the implementation process (triangulation), such as a group interview, written questionnaires and interviews on 2 occasions and by interviewing both caregivers. We therefore consider the results internally valid. Our findings about the implementation of nurse-delivered cardiovascular prevention are transferable to similar settings.

Discussion of results

Studies on implementation of clinical guidelines and innovations have mainly focused on doctors (Grimshaw et al. 2004). More research on implementation in the area of nursing is needed (van Achterberg et al. 2008). Findings from a review by Thomas et al. 2000, provide some evidence that guideline driven care can be effective in changing the process and outcome of care provided by professions allied to medicine. Since nurses are accustomed to working with protocols (Hulscher et al. 1997), practice nurses might be important in the implementation of guidelines in primary health care. It has also been suggested that implementation activities should be informed by theoretical perspectives and by evidence of those strategies shown to be most effective in relation to changing caregivers' behaviour (Thomas et al. 2000, van Achterberg et al. 2008). **In our study, we found** practice nurses facilitating the implementation of cardiovascular prevention within the health care centre by stimulating communication between professionals, by discussing discrepancies between actual and recommended performance and by taking responsibility for removal of barriers to implementation. Some studies have highlighted the potential advantage of exploiting networking as a key to conveying evidence to doctors (Seto et al. 1991, Gabbay and le May 2004). This role was played by nurses. Other factors facilitating implementation were practice nurses' high job satisfaction, their perceived support from GPs (mutual confidence) and practice nurses' feeling of responsibility for executing the guideline. These factors are considered to be important keys to high-quality patient care (Ring et al. 2005, Halcomb et al. 2008, Goossens et al. 2008). **Our study adds evidence to support the involvement of practice nurses in risk management for cardiovascular diseases.**

Implication for practice and research

Previous research agrees with our findings about facilitators and barriers to implementation of **guidelines and health care innovation** (Cabana et al. 1999, Peters et al. 2003, Koh et al. 2008, Goderis et al. 2009). Cardiovascular prevention consultation

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2
3 could further be improved through better adherence to the guideline. In our survey it
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5 was found that both GPs and practice nurses feel the need to adjust treatment goals to
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7 the specific patient problem (Fharm et al. 2009). Further research is necessary to
8
9 address this issue (Corrigan et al. 2006). Furthermore, it turned out that continuous
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11 education of practice nurses is needed, particularly concerning cardiovascular
12
13 diseases, drug therapy and lifestyle interventions (McDonnell et al. 1997). For a
14
15 successful implementation, it is also important that the professionals who are involved
16
17 define how they might work together (Elovainio et al. 2000) and how they might
18
19 communicate (Foy et al.) since these aspects are associated with (dis)continuity in care
20
21 and quality of care (Moore et al. 2003, Ahgren and Axelsson 2005). In the region where
22
23 the trial was held, the GP board and hospital developed an primary care chain of care
24
25 for cardiovascular prevention. This resulted in concrete agreements about job
26
27 descriptions between caregivers, criteria of treatment and referral (RHZ 2010).
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29 Furthermore, regarding the guideline, ambivalence exists concerning caregivers'
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31 versus patients' own responsibility (Fharm et al. 2009). Nurses experienced difficulty in
32
33 motivating patients to take cardiovascular prevention seriously. In addition, improved
34
35 computer systems could facilitate systematic screening and monitoring (Weingarten et
36
37 al. 1989, McDonnell et al. 1997, Brown et al. 1999). Finally, in order to avoid
38
39 researcher bias and sample bias, future qualitative research on implementation of
40
41 nurse-led cardiovascular prevention should be undertaken in a more confidential
42
43 setting, for example within the regular training for nurses and general practitioners.
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50 51 CONCLUSION

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53 Both GPs and practice nurses were positive about nurse-delivered cardiovascular
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55 prevention. Practice nurses were supportive of further implementation of cardiovascular
56
57 prevention within the health care centre. Nurses played an important role in the
58
59 successive removal of barriers. Improvement in the quality of cardiovascular prevention
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is a necessity. Further research is needed to address issues hindering implementation

of prevention. The extended implementation model we used in our study (i.e. job description and communication between caregivers) could be used in nursing science in situations where nurses are working in teams and under the supervision of doctors.

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Box 1. Second round of interviews with caregivers: Questionnaire topics (March, 2008)

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6	Introduction
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8	Promoting and hampering factors concerning nurse-delivered cardiovascular
9	prevention (guideline, collaboration with PN/GP, treatment of patients, organization).
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12	Questionnaire topics
13	
14	- Communication between practice nurse and GPs (frequency, duration, involved
15	GPs)
16	
17	- Job description and collaboration among GPs and nurses
18	
19	- Statements (level of agreement): guideline, patients, organization, technical
20	assistance, collaboration, needs, feedback, referral
21	
22	- Practice nurses' performance
23	
24	- Practice nurses' job satisfaction
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26	- Future role of nurse-delivered cardiovascular prevention
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28	- Criteria for referral (preventive consultation, GP, specialist and other professionals)
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30	- Treatment targets
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32	- Other promoting and hampering factors and suggestions
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34	- Caregiver' characteristics
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Table 1. Characteristics of interviewed general practitioners and practice nurses

	General practitioners (N=6)	Practice nurses (N=6)
Age, mean/range (years)	40/ 33-52	41/ 26-46
Females (N)	2	5
Group practice (N)	6	-
Recently started as employee in centre (N)	1	3
High affinity with cardiovascular diseases (N)	3	-
> 20 years nursing experience (N)	-	5
Bachelor of 'nursing' (N)		6

Review Copy

Table 2. Encountered categories of barriers to implementation of cardiovascular prevention

Themes	Categories
Caregivers: Job description	GPs' knowledge about the guideline Attitudes towards treatment targets Nurses' need for additional training Nurses' fear of losing nursing tasks Limits of diet and exercise advice Treatment about smoking Job description within shared care
Caregivers: Communication	Structural communication between GPs and nurses GPs coaching nurses Need for a referral checklist Communication between specialists and GPs
Guideline	Start of medical treatment Limitation of target group or tasks Consultation with older patients Motivational interviewing and shared decision making
Patients	No response to invitation Lack of motivation (follow-up, changing lifestyle) Careful approach to high risk patients Patients who also visit a specialist
Context	Workload for organization Clinic opening hours Limits of computer system and poor patient recording Physical space and material equipment

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3 Experiences of doctors and nurses implementing nurse-delivered cardiovascular
4 prevention in primary care: a qualitative study
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8 9 10 ABSTRACT

11 12 13 Aim

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15 This paper reports on a study of the experiences of general practitioners and practice
16 nurses implementing nurse-delivered cardiovascular prevention to high risk patients in
17 primary care.
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22 23 24 Background

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26 Difficulties may arise when innovations are introduced into routine daily practice.
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28 Whether or not implementation is successful is determined by different factors related
29 to caregivers, patients, type of innovation and context.
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38 A qualitative study nested within a randomised trial (2006-2008) to evaluate the
39 effectiveness of nurse-delivered cardiovascular prevention. Six primary health care
40 centres in the Netherlands (25 general practitioners, 6 practice nurses) participated in
41 the trial. Interviews were held on two occasions: at three and at 18 months after
42 commencement of consultation. The first occasion was a group interview with six
43 practice nurses. The second consisted of semi-structured interviews with one general
44 practitioner and one practice nurse from each centre.
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57 Main barriers to the implementation included: lack of knowledge about the guideline,
58 attitudes towards treatment targets, lack of communication, insufficient coaching by
59 doctors, content of life style advice. At the start of the consultation project, practice
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3 nurses expressed concern of losing nursing tasks. Other barriers were related to
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5 patients (lack of motivation), the guideline (target population) and organisational issues
6
7 (insufficient patient recording and computer systems).
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10 11 Conclusions

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13 Both general practitioners and practice nurses were positive about nurse-delivered
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15 cardiovascular prevention in primary care. Nurses could play an important role in
16
17 successive removal of barriers to implementation of cardiovascular prevention.
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20 **Mutual confidence between care providers in the health care team is necessary.**
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23 24 25 Keywords

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27 Cardiovascular prevention; implementation; nursing; primary care; general
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29 practitioners; adherence.
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SUMMARY

What is already known about this topic

- * Difficulties may arise when innovations are introduced into routine daily practice.
- * Cardiovascular prevention in general practice is still not optimal
- * Involvement of nurses may improve the implementation of cardiovascular prevention.

What this paper adds

- * Nurses were found to be important facilitators of the implementation of cardiovascular prevention in the health care centres
- * Mutual confidence between care providers in the health care team is necessary for nurses to undertake this role.

Implication for practice and/or policy

- * Nurses have a definite role in assisting general practitioners to improve cardiovascular prevention in community populations in health care centres.
- * Nevertheless, there is room for quality improvement.

INTRODUCTION

Difficulties may arise when clinical guidelines and innovations are introduced into routine daily practice. Whether or not implementation is successful is determined by different factors related to caregivers, patients, the innovation and the organisational and financial system (Grol et al. 2005). The implementation of any innovation demands effective communication and the removal of hindrances (Davis and Taylor-Vaisey 1997). Studies have shown that nurse-led clinics are more successful in the implementation of guidelines (Shaffer and Wexler 1995, Thomas et al. 2000). Guideline-driven care can be effective in changing the process and outcome of care provided by professions allied to medicine. (Thomas et al. 2000). However, more research on implementation in the area of nursing is needed. Implementation of evidence-based interventions is crucial to professional nursing and the quality and safety of patient care (van Achterberg et al. 2008). The study reported here is a contribution to this research; it comprises an evaluation of the experiences of caregivers with the implementation of a nurse-led cardiovascular prevention consultation in general practice and its underlying guideline (i.e. the intervention). It was conducted in the Netherlands and data were collected between 2006 and 2008. Although experiences of caregivers with implementation of nurse-led interventions will be different across health care settings, the findings remain relevant to evolving international knowledge in nursing science.

BACKGROUND

Concerning cardiovascular prevention, studies in primary care where the majority of high risk patients should be treated for cardiovascular risk factors have reported considerable potential to further increase the quality of care (Wood et al. 2008, Kotseva et al. 2009). Improvement of adherence to guidelines on cardiovascular prevention by caregivers and patient compliance to lifestyle advice and prescribed treatment is therefore still necessary (EUROASPIRE 2001, Penning-van Beest et al. 2007).

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3 Studies have shown that nurses can contribute to improvement of cardiovascular
4 prevention (Clark et al. 2010, Khunti et al. 2007). Nurses tend to be more compliant to
5 guidelines than doctors (Hulscher et al. 1997). The authors conducted a randomised
6 trial on the clinical effectiveness of nurse-delivered cardiovascular prevention to high-
7 risk patients in primary care (Voogdt-Pruis HR et al. 2010). Six primary health care
8 centres in the Netherlands (25 general practitioners, 6 practice nurses) participated.
9
10 The trial population consisted of 701 patients aged 30–74 years, with at least a 10%
11 10-year risk of fatal **cardio vascular disease** according to the SCORE (Systematic
12 Coronary Risk Evaluation) risk function (Conroy et al. 2003). Of the included patients,
13 91% had already been diagnosed with cardiovascular diseases. Randomization at the
14 patient level resulted in half of the patients to receive nurse-delivered care and the
15 other half standard care by general practitioners. Our qualitative study also reports on
16 prevention to patients at lower risk. Although these patients were excluded from the
17 trial population, they still received treatment according to the Dutch guideline (CBO and
18 NHG 2006). The multi-disciplinary Dutch guideline on cardiovascular prevention, which
19 was introduced just before starting the trial, was used as protocol for this trial (CBO and
20 NHG 2006). Information about the process of implementation is useful because it can
21 add value to existing data about quantitative effectiveness. Qualitative studies can
22 reveal which factors determine the implementation of nurse-delivered prevention and
23 show which role practice nurses and general practitioners play in the implementation
24 (Pope et al. 2002, Hulscher et al. 2003). The implementation-model described by Grol
25 et al. (Grol and Grimshaw 2003, Peters et al. 2003, Grol et al. 2005) was used as
26 conceptual model.
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THE STUDY

Aim

The aim of the study was to examine the experiences (barriers and facilitators) of general practitioners (GPs) and practice nurses implementing nurse-delivered cardiovascular prevention in primary care between 2006 and 2008.

Design

Interviews with GPs and practice nurses were conducted within a randomised trial examining the effectiveness of nurse-delivered cardiovascular prevention at primary care level (Pope et al. 2002, Lambert and Loiselle 2008). Six primary health care centres in the Netherlands (25 GPs, 6 practice nurses) participated in the trial. Interviews were held on two occasions during the period 2006 to 2008.

Participants

Six practice nurses participating in the trial (i.e. the intervention group) joined the first group interview. Standard care was given by GPs, hence no group interview was held with GPs. After completion of the trial, **semi-structured** interviews were held with all six practice nurses and with one GP from every centre (six GPs in total, of all 25 GPs). The GP who was the main supervisor of the practice nurse in the health care centre was interviewed. This was done in order to gain insight into the level of cooperation between the general practitioner and the practice nurse from the perspective of both caregivers.

Data collection

Interviews were held 3 and 18 months after the start of the nurse-led prevention programme. The first interview at 3 months started with the interview lasting one hour and a half. For this group interview, practice nurses were asked to write down all their

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3 negative and positive experiences of prevention consultation. These experiences were
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5 then discussed in the whole group. Interviews were held without the presence of the
6
7 general practitioners.
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10 For the second round of interviews, after completion of the trial, **semi-structured**
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12 interviews were held with the practice nurse and one GP from every centre, at the
13
14 health care centre. Two different questionnaires with overlapping questions were used,
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16 one for GPs and one for practice nurses. The questions were derived from the
17
18 'implementation model' based on that described by Grol et al. (Grol and Grimshaw
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20 2003, Peters et al. 2003, Grol et al. 2005), from the group interview with practice
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22 nurses, and from an explorative study on the feasibility of nurse-led cardiovascular
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24 prevention (Leenders et al. 2006). Mainly open-ended questions were used. Topics for
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26 the questionnaire are listed in box 1. Again, the interviewees had to write down their
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28 answers first and **explain** these afterwards to the researcher (HV). This method was
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30 chosen in order to give participants more time to think about the questions asked, to
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32 challenge them to describe the situation succinctly, and to minimise interpersonal
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34 interaction (**Sudman et al. 1996, Lambert and Loiselle 2008**). The second part of the
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36 interview, in which answers were discussed, provided interviewees with the opportunity
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38 to clarify their answers. All interviews were audio taped, transcribed verbatim by a
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40 research assistant and checked by the researcher. All interviews were held by an
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42 experienced interviewer (HV) who was also a member of the research team.
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49 Ethical considerations

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51 The Medical Ethical Committee of the University **approved** the research being
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53 **undertaken** (reference: METC/A06–007). For all interviews, it was emphasised that any
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55 individual answers from individual participants would not be communicated to the other
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57 caregivers.
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Data analysis

A qualitative content analysis with a directed approach was used (Mayring 2000, Graneheim and Lundman 2004, Hsieh and Shannon 2005). Themes were derived from the implementation-model described by Grol et al. (Grol and Grimshaw 2003, Peters et al. 2003, Grol et al. 2005). Two researchers (HV, GB) analysed the transcript independently of each other. Themes were allocated to all negative and positive fragments of the transcript. The two researchers compared their results and agreed to use two sub-themes for 'Caregiver' within this model: 'Job description of caregivers' and 'Communication between caregivers' to make a distinction between the different roles of GPs, practice nurses and other professionals within nurse-led cardiovascular prevention and to describe the collaboration. Furthermore, the other themes 'Guideline', 'Patient' and 'Context and organisation' from the model were used. The transcript was analysed again by one researcher (HV).

Validity and reliability

In order to improve consistency and reliability and to minimise bias, the analysis was checked and discussed with all authors, and categories were formulated. To illustrate the findings quotations are given, translated into English. These quotations were chosen with the agreement of all authors.

RESULTS

Six nurses and an equal number of GPs were interviewed. Five out of 6 practice nurses were female and the majority had several years of work experience. In contrast 2 out of 6 GPs were male, but they were similar regarding age. Three had a specific interest in cardiovascular diseases. (Table 1).

Job description of caregivers

The job description for practice nurses and GPs was based on the guideline. According to GPs, practice nurses had enough knowledge about cardiovascular diseases to carry out prevention consultation to a good standard. Practice nurses regarded themselves as responsible for giving lifestyle advice, monitoring risk, and checking for potential cardiovascular problems. GPs perceived themselves to be responsible for thorough medical examination and medical treatment. Practice nurses were satisfied with their job; 'valuable' (P2, P4, P6), 'educational' (P1, P3) and 'challenging' (P1, P5). All but one GP thought practice nurses referred patients to them on time. GPs' reasons for referral to specialists were: difficulty with normalising blood pressure or lipids, worsening of symptoms or development of new symptoms, and because of an acute event. The following barriers concerning job description were mentioned (Table 2):

At the start of prevention consultation, practice nurses had to alert GPs to the guideline. *'I noticed that the GPs were not so strict in keeping the guideline. They accepted higher levels of risk factors'* (P4). One practice nurse regarded this as her responsibility *'GPs have to keep to so many different guidelines. They have the luxury that the practice nurse makes them aware of these'* (P1). In addition to this, it became apparent that caregivers had different attitudes towards treatment targets. *'It's important that GPs are all in agreement, otherwise similar blood test results would then be interpreted differently'* (P3). Some practice nurses stated that at first they had a fear of losing nursing tasks. They also questioned the limits of diet and exercise intervention. *'I'm not really up to date with how much exercise a patient can do after an*

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3 *infarction. What do I need to examine? How do i know his exercise capacity?*

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5 (P3). Furthermore, practice nurses experienced a lack of ability to implement 'stop-
6 smoking' treatment well. As consultations continued, practice nurses said they needed
7 more medical background to improve cardiovascular consultation. One GP noticed that
8 *'Some practice nurses were community nurses in the past. They are not really trained*
9 *in counselling. How do you approach patients, motivate them into good behaviour? ...*
10 *good counselling is essential'* (G4). More difficulties with job description were
11 experienced within shared care. *'It is not clear which patients are treated by a*
12 *cardiologist. If a patient gets a heart attack, he will be treated by a specialised nurse. I*
13 *will treat them eventually, but when will that be? ... Job responsibilities should be made*
14 *more clear'* (P6).
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29 Communication between caregivers

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31 In all but one centre, every week or every two weeks practice nurses had regular
32 meetings with the GP to discuss their patients. Initially all the patients were discussed
33 but after a while, discussions were focussed on patients with problems. They talked
34 about medication, elevated risk factors and new or worsening symptoms. Besides the
35 regular meetings, practice nurses and GPs communicated by e-mail, telephone or had
36 'corridor discussions', which were initiated by practice nurses. According to practice
37 nurses, GPs were always available to answer questions.
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46 GPs stated that practice nurses communicated 'well' with them, without taking too
47 much time. They both stated that mutual appointments were kept. In most centres, one
48 GP was the contact person for the practice nurse although in special cases the practice
49 nurse would also communicate with other GPs. GPs were confident in the practice
50 nurse and this was also perceived by practice nurses. In all but one centre, referral to
51 other caregivers such as a dietician or a physiotherapist was always supervised by the
52 GP.
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3 The following barriers concerning job description were mentioned: Before commencing
4 consultation, little communication between GPs about the guideline was apparent. In
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7 addition to this, GPs did not know how to structure communication between the
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10 practice nurse and other GPs in daily practice. Although communication between GP
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12 and practice nurse went well, they both lacked communication about practice nurses'
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14 performance. With regard to patients' referral from practice nurse to GP, one GP
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16 suggested creating a checklist. *'It is good to agree in advance what would give cause*
17
18 *for alarm. Perhaps there are times when it is less evident'* (G6). Practice nurses
19
20 wondered with whom to communicate in the case of a patient visiting a specialist.
21
22 Some practice nurses gave patients messages for the specialist whereas others only
23
24 communicated with the GP. Besides this, practice nurses noticed a lack of
25
26 communication between specialists and GPs.
27
28
29
30

31 Guideline on cardiovascular prevention

32
33 GPs and practice nurses had a positive attitude towards the guideline. They fully
34
35 agreed with the following characteristics of the guideline; 'evidence-based', 'positive
36
37 results', 'clearly written'. Benefits listed were structural check-ups, target orientated
38
39 treatment, better compliance and adherence, and the diagnosis of new diabetics. GPs
40
41 did agree with the statement that nurses are necessary for the management of
42
43 cardiovascular prevention. Practice nurses became familiar with the consultation
44
45 quickly. Acquiring new knowledge of medication and its complications required more
46
47 effort. GPs who had a special interest in cardiovascular disease were more aware of
48
49 lipid treatment targets.
50
51

52
53 Some GPs and practice nurses experienced difficulty in following the guideline in the
54
55 instance of a patient with a low risk profile but with a high blood pressure. They would
56
57 adhere to the old guideline for hypertension. Furthermore, practice nurses had different
58
59 opinions about guideline implementation within the secondary prevention group. *'I start*
60
from step one; in case a patient has a blood pressure of 140, a new appointment for

1
2
3 *measurement of blood pressure will be made. That blood pressure must come down.'*
4
5 (P1), *'I'm acting in a different way; i don't make another appointment because the*
6
7 *patient has already received treatment'* (P6). Caregivers stated that limitation of task or
8
9 patient group is necessary when starting consultations. The guideline should be
10
11 implemented gradually. One GP stated *'A couple of years ago, a blood pressure of*
12
13 *160/90 was okay, but now the targets are so strict. So many people will receive*
14
15 *medication, for such a long time'* (G3). Practice nurses also hesitated to consult older
16
17 patients. Surprisingly, in contrast to practice nurses, GPs said they often used
18
19 motivational interviewing and shared decision making within consultations. Practice
20
21 nurses perceived motivational interviewing as time consuming and sometimes difficult
22
23 to apply.
24
25
26
27
28

29 Patients

30
31 According to caregivers, patients were aware of the benefits of cardiovascular
32
33 prevention and they were motivated to visit for consultation. Patients *like to know blood*
34
35 *test results*. Nevertheless, it took considerable effort to invite patients to attend for risk
36
37 assessment. According to practice nurses, one third did not respond to the invitation
38
39 letter or could not even be contacted by telephone.
40
41 It generally proved to be difficult to motivate patients who rarely visited the practice. *'A*
42
43 *negative aspect is the 'No show'. That is really a problem. I continuously have to check*
44
45 *whether a patient has visited me'* (P4). Some patients lacked motivation to attend for
46
47 follow-up and some refused to change their lifestyle. *'A few patients visit for*
48
49 *consultation, but make no changes at all in their own lifestyle. Maybe they even*
50
51 *actually think coming to us is like a kind of little trip out'* (P1). Practice nurses noticed
52
53 that they had to be careful with smokers and overweight patients; they needed more
54
55 motivation. *'I constantly need to explain why it is so important to lose weight. The*
56
57 *problem is that patients do not immediately see results'* (P5). It was better not to
58
59 mention smoking at all in the invitation letter. Even patients with low risk profile and
60

1
2
3 patients who did not experience immediate benefit from preventative treatment needed
4
5 motivation and should be encouraged to attend for follow-up. *'Being weighed is the one*
6
7 *thing they particularly hate. So I firstly try to get their confidence in me'* (P2). At the
8
9 start, patients who also visited a specialist questioned the reason for visiting the
10
11 practice nurse.
12
13

16 Context and Organisation

17
18 Initially, a group of 30-40 patients were invited for risk assessment in order to avoid the
19
20 problem of many patients visiting the centre at the same time. A barrier to invitation for
21
22 risk assessment was poor record keeping about smoking behaviour, diagnoses, and
23
24 treatment by specialist. Extending clinic opening hours after 5 pm would make it easier
25
26 for patients to attend, particularly those in employment. According to practice nurses,
27
28 practice assistants could also be involved in inviting patients but should be able to
29
30 motivate patients as well. At one centre, practice assistants were involved in the
31
32 measurement of blood pressure. Most practice nurses used an electronic
33
34 cardiovascular risk card within the GP's electronic patient record, which proved to be a
35
36 helpful tool. Some practice nurses lacked the ability to register special circumstances
37
38 or treatment. In addition, both practice nurses and GPs would like to have the risk
39
40 score calculated automatically.
41
42
43

44 The lack of physical space limited one centre to continue the implementation of nurse-
45
46 delivered cardiovascular prevention. GPs indicated that for better cooperation within
47
48 shared care, it would be desirable to implement a chain of care and an integrated
49
50 electronic patient record system.
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DISCUSSION

Limitations

In this qualitative study, we examined the experiences of GPs and nurses implementing nurse-delivered cardiovascular prevention in general practice. The findings should be read with some considerations. Firstly, the findings might be biased because self-reported answers were used (recall bias and social desirability bias). In addition, the interviewer who belonged to the research team, could also have influenced the results in a positive way (social desirability bias) (Adams et al. 1999). Secondly, our nurses had extensive work experience, although they had not specialised in heart disease prevention. It is nevertheless possible that the practice nurses in our study were more successful in the implementation of nurse-led cardiovascular prevention consultation compared to others, since they were aware that their performance was being assessed (i.e. Hawthorne effect). Implementation can be less effective among less experienced or less committed nurses (Thomas et al. 2000). In addition to this, half of the 6 interviewed GPs had a special interest in cardiovascular diseases. These positive attitudes promote effective implementation (Grol et al. 2005, van Achterberg et al. 2008). Thirdly, the group interview with all the nurses 3 months after commencing the project may have facilitated the implementation process. By that time, no group interview with GPs was held in order to avoid influencing standard GP care within our trial. However, we combined several methodologies to study the implementation process (triangulation), such as a group interview, written questionnaires and interviews on 2 occasions and by interviewing both caregivers. We therefore consider the results internally valid. Our findings about the implementation of nurse-delivered cardiovascular prevention are transferable to similar settings.

Discussion of results

Studies on implementation of clinical guidelines and innovations have mainly focused on doctors (Grimshaw et al. 2004). More research on implementation in the area of nursing is needed (van Achterberg et al. 2008). Findings from a review by Thomas et al. 2000, provide some evidence that guideline driven care can be effective in changing the process and outcome of care provided by professions allied to medicine. Since nurses are accustomed to working with protocols (Hulscher et al. 1997), practice nurses might be important in the implementation of guidelines in primary health care. It has also been suggested that implementation activities should be informed by theoretical perspectives and by evidence of those strategies shown to be most effective in relation to changing caregivers' behaviour (Thomas et al. 2000, van Achterberg et al. 2008). **In our study, we found** practice nurses facilitating the implementation of cardiovascular prevention within the health care centre by stimulating communication between professionals, by discussing discrepancies between actual and recommended performance and by taking responsibility for removal of barriers to implementation. Some studies have highlighted the potential advantage of exploiting networking as a key to conveying evidence to doctors (Seto et al. 1991, Gabbay and le May 2004). This role was played by nurses. Other factors facilitating implementation were practice nurses' high job satisfaction, their perceived support from GPs (mutual confidence) and practice nurses' feeling of responsibility for executing the guideline. These factors are considered to be important keys to high-quality patient care (Ring et al. 2005, Halcomb et al. 2008, Goossens et al. 2008). **Our study adds evidence to support the involvement of practice nurses in risk management for cardiovascular diseases.**

Implication for practice and research

Previous research agrees with our findings about facilitators and barriers to implementation of **guidelines and health care innovation** (Cabana et al. 1999, Peters et al. 2003, Koh et al. 2008, Goderis et al. 2009). Cardiovascular prevention consultation

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2
3 could further be improved through better adherence to the guideline. In our survey it
4
5 was found that both GPs and practice nurses feel the need to adjust treatment goals to
6
7 the specific patient problem (Fharm et al. 2009). Further research is necessary to
8
9 address this issue (Corrigan et al. 2006). Furthermore, it turned out that continuous
10
11 education of practice nurses is needed, particularly concerning cardiovascular
12
13 diseases, drug therapy and lifestyle interventions (McDonnell et al. 1997). For a
14
15 successful implementation, it is also important that the professionals who are involved
16
17 define how they might work together (Elovainio et al. 2000) and how they might
18
19 communicate (Foy et al.) since these aspects are associated with (dis)continuity in care
20
21 and quality of care (Moore et al. 2003, Ahgren and Axelsson 2005). In the region where
22
23 the trial was held, the GP board and hospital developed an primary care chain of care
24
25 for cardiovascular prevention. This resulted in concrete agreements about job
26
27 descriptions between caregivers, criteria of treatment and referral (RHZ 2010).
28
29 Furthermore, regarding the guideline, ambivalence exists concerning caregivers'
30
31 versus patients' own responsibility (Fharm et al. 2009). Nurses experienced difficulty in
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33 motivating patients to take cardiovascular prevention seriously. In addition, improved
34
35 computer systems could facilitate systematic screening and monitoring (Weingarten et
36
37 al. 1989, McDonnell et al. 1997, Brown et al. 1999). Finally, in order to avoid
38
39 researcher bias and sample bias, future qualitative research on implementation of
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41 nurse-led cardiovascular prevention should be undertaken in a more confidential
42
43 setting, for example within the regular training for nurses and general practitioners.
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50 51 CONCLUSION

52 Both GPs and practice nurses were positive about nurse-delivered cardiovascular
53
54 prevention. Practice nurses were supportive of further implementation of cardiovascular
55
56 prevention within the health care centre. Nurses played an important role in the
57
58 successive removal of barriers. Improvement in the quality of cardiovascular prevention
59
60 is a necessity. Further research is needed to address issues hindering implementation

of prevention. The extended implementation model we used in our study (i.e. job description and communication between caregivers) could be used in nursing science in situations where nurses are working in teams and under the supervision of doctors.

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Box 1. Second round of interviews with caregivers: Questionnaire topics (March, 2008)

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6	Introduction
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8	Promoting and hampering factors concerning nurse-delivered cardiovascular
9	prevention (guideline, collaboration with PN/GP, treatment of patients, organization).
10	
11	
12	Questionnaire topics
13	
14	- Communication between practice nurse and GPs (frequency, duration, involved
15	GPs)
16	
17	- Job description and collaboration among GPs and nurses
18	
19	- Statements (level of agreement): guideline, patients, organization, technical
20	assistance, collaboration, needs, feedback, referral
21	
22	- Practice nurses' performance
23	
24	- Practice nurses' job satisfaction
25	
26	- Future role of nurse-delivered cardiovascular prevention
27	
28	- Criteria for referral (preventive consultation, GP, specialist and other professionals)
29	
30	- Treatment targets
31	
32	- Other promoting and hampering factors and suggestions
33	
34	- Caregiver' characteristics
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Table 1. Characteristics of interviewed general practitioners and practice nurses

	General practitioners (N=6)	Practice nurses (N=6)
Age, mean/range (years)	40/ 33-52	41/ 26-46
Females (N)	2	5
Group practice (N)	6	-
Recently started as employee in centre (N)	1	3
High affinity with cardiovascular diseases (N)	3	-
> 20 years nursing experience (N)	-	5
Bachelor of 'nursing' (N)		6

Review Copy

Table 2. Encountered categories of barriers to implementation of cardiovascular prevention

Themes	Categories
Caregivers: Job description	GPs' knowledge about the guideline Attitudes towards treatment targets Nurses' need for additional training Nurses' fear of losing nursing tasks Limits of diet and exercise advice Treatment about smoking Job description within shared care
Caregivers: Communication	Structural communication between GPs and nurses GPs coaching nurses Need for a referral checklist Communication between specialists and GPs
Guideline	Start of medical treatment Limitation of target group or tasks Consultation with older patients Motivational interviewing and shared decision making
Patients	No response to invitation Lack of motivation (follow-up, changing lifestyle) Careful approach to high risk patients Patients who also visit a specialist
Context	Workload for organization Clinic opening hours Limits of computer system and poor patient recording Physical space and material equipment