

Effects of educational interventions on primary dementia care: A systematic review

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Objective: To determine the effects of educational interventions about dementia, directed at primary care providers (PCPs).

Design: We searched Medline, Embase, PsycInfo, Cinahl and the Cochrane library for relevant articles. Two researchers independently assessed the citations identified against the following inclusion criteria: educational intervention on dementia directed at PCPs and study designs being randomized controlled trials (RCTs), controlled clinical trials (CCTs), controlled before and after studies (CBAs) or interrupted time series (ITS) analyses. Outcomes of interest were PCPs' knowledge and attitude on dementia, and quality of dementia care at PCP and patient level.

Results: Of 3953 citations identified, six articles representing five studies (four cluster RCTs and one CBA) were eligible, describing educational interventions directed at 1904 PCPs. Compliance to the interventions varied from 18 to 100%. Systematic review of the studies showed moderate positive results. Five articles reported at least some effects of the interventions. A small group workshop and a decision support system (DSS) increased dementia detection rates. An interactive 2-h seminar raised GPs' suspicion of dementia. Adherence to dementia guidelines only improved when an educational intervention was combined with the appointment of dementia care managers. This combined intervention also improved patients' and caregivers' quality of life. Effects on knowledge and attitudes were minor.

Conclusion: Educational interventions for PCPs that require active participation improve detection of dementia. Educational interventions alone do not seem to increase adherence to dementia guidelines. To effectively change professionals' performance in primary dementia care, education probably needs to be combined with adequate reimbursement or other organizational incentives. Copyright © 2010 John Wiley & Sons, Ltd.

Key words: dementia; education; guideline adherence; primary care

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Introduction

Dementia is under-diagnosed in primary care. (Eefsting *et al.*, 1996; Valcour *et al.*, 2000; Lopponen *et al.*, 2003) General practitioners (GPs) play an important role in early detection of dementia, for they are usually the first health care professionals to be contacted by patients with cognitive disorders. However, GPs state that lack of knowledge and skills in diagnosing and

treating dementia and fear of diagnostic errors prevent them from starting diagnostic work-up. (Downs *et al.*, 2000; van Hout *et al.*, 2000; Cahill *et al.*, 2006) Other GP-related barriers include the absence of reliable screening tools, lack of time and financial reward, and limited access to neuropsychological consultations and neuro-imaging investigations (Olafsdottir *et al.*, 2001; Turner *et al.*, 2004). GPs could bypass all these problems by referring patients with cognitive problems

to multidisciplinary memory clinics. GPs that refer patients to memory clinics mainly have positive experiences especially regarding on the diagnostic expertise (van Hout *et al.*, 2001; Gardner *et al.*, 2004). Memory clinics are also appreciated for their follow-up facilities and their abilities to counteract stigma (Jolley and Moniz-Cook, 2009). Yet, despite the rapid growth of the number of memory clinics since the 1980s, under-diagnosis of dementia is still high. Explanations for this phenomenon could be the following. First, if GPs do not recognize early signs of dementia in their patients, they will not consider referring patients to memory clinics. Second, if GPs are sceptical about the benefits of early diagnosis, because they feel they have little to offer to dementia patients (Turner *et al.*, 2004), they will probably refrain from both formally diagnosing dementia themselves and from referral. To overcome these barriers, it is necessary to improve GPs' knowledge and attitudes on early dementia diagnosis and on options in dementia management. National authorities and dementia experts from several European countries explicitly formulated that 'raising GPs' awareness and training them to recognize the early symptoms of dementia' are the primary areas of importance (Wolbert, 2007; De Lepeleire *et al.*, 2008; Lustman *et al.*, 2008; Burns and Robert, 2009; Department of Health, 2009). Previous observational research showed positive effects of GP training on their attitudes regarding the value of early dementia diagnosis (Renshaw *et al.*, 2001). In order to determine more precisely whether educational interventions for GPs and other primary care providers (PCPs) can be effective in improving their knowledge, attitudes and, most importantly, the quality of primary dementia care, we performed a systematic review of the literature.

Methods

Search strategy

We conducted a systematic literature search in MEDLINE, CINAHL, PsycInfo, EMBASE and the Cochrane library, without any limits, up to January 2009. We used the search strategy of the Cochrane Effective Practice and Organisation of Care Group (EPOC) (Bero *et al.*, 2008), from which we selected search terms on educational strategies and intervention programs, and combined these with the search term 'dementia' as free text word and as a MeSH term or as equivalent index terms.

Selection of studies

For inclusion, studies needed to meet the following criteria: (1) target populations were PCPs, (2) the intervention aimed to influence professional practice, by means of professional interventions (Box 1) as defined by the EPOC (Bero *et al.*, 2008), (3) the educational intervention focused on detection and management of dementia and (4) the study designs were randomized controlled trials (RCTs), controlled clinical trials (CCTs), controlled before and after studies (CBAs) and interrupted time series (ITS) analyses with at least three data points before and three after the intervention. Two researchers (MP and ID) independently selected abstracts from the citations identified, based on the inclusion criteria. Of the selected abstracts, they obtained the full text articles and assessed these for possible inclusion. In case of disagreement among the two researchers, discussion led to consensus. Agreement between reviewers was measured using kappa analysis, reported using the Cohen kappa index.

Box 1. Professional interventions defined by the Cochrane Group Effective Practice and Organisation of Care

Professional interventions

1. Distribution of educational materials
2. Educational meetings
 - a. Small workshops (active participation)
 - b. Big seminars (passive participation)
3. Local consensus processes
4. Educational outreach visits
5. Local opinion leaders
6. Patient mediated interventions
7. Audit and feedback
8. Reminders (including computer decision support systems)
9. Marketing
10. Mass media

Outcomes and data extraction

Outcomes were classified according to the three most important levels of effectiveness for research in education (Belfield *et al.*, 2001) (Box 2): (1) health care outcomes (patients, informal caregivers), (2) health professionals' behaviour, performance or practice (dementia detection, adherence to guidelines) and (3) knowledge and learning (PCPs' knowledge and attitude). Outcomes and their method of measurement

were extracted from the included studies. Furthermore, data on setting, numbers of participants, type of educational strategy, follow-up, compliance to the intervention and methodological quality according to the EPOC criteria (Bero *et al.*, 2008) were obtained. Two researchers (MP and ID) collected all data independently, using a data collection checklist developed by the EPOC. In case of disagreement among the researchers, discussion led to consensus.

Box 2. Levels of effectiveness for research in education

1. Health care outcomes (patients, informal caregivers)
2. Health professionals' behaviour, performance or practice
3. Learning or knowledge
4. Reaction or satisfaction of participants
5. Participation or completion

Analysis

We carried out a narrative synthesis of the data extracted. Performing a meta-analysis would have been inappropriate, because of the small number of eligible studies presenting a large diversity of outcome measures, study populations and interventions.

Results

The search strategy identified 3953 citations. Of the 17 abstracts selected as potentially relevant for full text

review, 11 articles were excluded for not meeting the inclusion criteria, with an agreement by κ coefficient of 0.88. (Figure 1) Six articles, totally including 1904 PCPs, mainly GPs, were eligible. Five papers reported on RCTs (Chodosh *et al.*, 2006; Downs *et al.*, 2006; Vickrey *et al.*, 2006; Vollmar *et al.*, 2007; Rondeau *et al.*, 2008) and one on a CBA (Waldorff *et al.*, 2003). Two papers (Chodosh *et al.*, 2006; Vickrey *et al.*, 2006) presented different results from the same trial. The intervention studied in these papers included both a series of seminars and the appointment of dementia care managers. Downs *et al.* studied three single-component interventions: a small group workshop, a decision support system (DSS) and an editorial CD-ROM. Rondeau *et al.* investigated the effects of a 2-h seminar. Chodosh, Vickrey, Downs and Rondeau all compared the intervention with no training at all. Waldorf *et al.* compared a multifaceted educational intervention with receiving dementia guidelines by mail. Vollmar *et al.* compared a short seminar with an extended seminar. Educational methods in all studies were mainly interactive. Follow-up ranged from several hours to 28 months (Table 1).

Methodological quality

The methodological quality of the studies was diverse (Table 2). According to the quality criteria of the EPOC Group, five studies had a least one important flaw. Waldorff's study, using a CBA design, only complied with the criterion of contamination protection. The

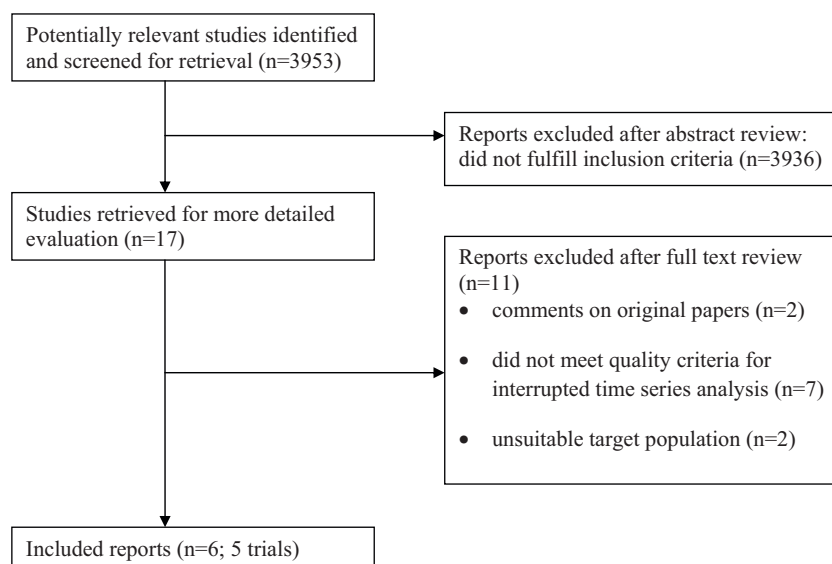


Figure 1 Flow of papers.

Table 1 Study characteristics

First author (country, publication year)	Study population	Numbers of PCPs in intervention/control group and patients	Intervention group(s)	Control group	Follow-up
Waldorff (Denmark, 2005)	GPs in Frederiksberg en Viborg County	511/216 GPs 4741 patients	Multi-faceted intervention consisting of: <ul style="list-style-type: none"> • Four seminars (all 511 GPs) • Additionally outreach visits (135 GPs), reminders (203 GPs) or CME small group training (173 GPs) 	Received clinical practice guideline for dementia by mail	12 months
Downs (UK, 2006)	General practices in London and central Scotland	26/9 practices (127 GPs) 683 patients	<ol style="list-style-type: none"> 1. Small group workshop (10 practices) 2. Decision support system (8 practices) 3. Electronic tutorial on CD-ROM (8 practices) 	No training	9 months
Chodosh ^a (USA, 2006)	Health care providers (HCP) from 16 primary care clinics	232 PCPs	Multi-faceted intervention consisting of: <ul style="list-style-type: none"> • Direct learning through 100 minutes interactive seminars in up to 5 sessions combined with handouts and website with seminar information • Indirect learning through collaboration with care manager 	No seminars	9 months
Vickrey ^a (USA, 2006)	Primary care clinics	9/9 clinics 408 patients	Multi-faceted intervention consisting of: <ul style="list-style-type: none"> • Installation of dementia care managers • Training primary care providers: 90 min standardized interactive seminars in up to five sessions 	No training and no dementia care managers	12–28 months
Vollmar (Germany, 2007)	GPs in Bayern	90/47 GPs	Extended, partly interactive seminar on dementia diagnostics and management (5 h)	Short, partly interactive seminar on dementia diagnostics (3 h)	3–5 h
Rondeau (France, 2008)	GPs in France	352/329 GPs 3021 patients	2 h educational group meeting	No training	17 months

GP, general practitioner; PCP, primary care provider.

^aPapers about the same study (ACCESS-trial).

Table 2. Methodological quality of studies as evaluated according to guidelines of the Cochrane Group of Effective Practice and Organisation of Care

First author (country, publication year)	Design	No differences in baseline measurement 1° outcome(s)	Adequate randomization and allocation concealment/adequate control site	Blinded assessment of 1° outcome(s)	Protection against contamination	Lost to follow-up 1° outcome(s)	Reliable 1° outcome measures	Compliance to intervention
Waldorff (Denmark, 2005)	CBA	– (differences)	?	–	+	1528 patients (32%)	–	Intervention participants attended to: • 2 intervention activities (n = 92, 18%) • 1 intervention activity (n = 271, 53%) • 0 intervention activities (n = 148, 29%)
Downs (UK, 2006)	Cluster RCT	+	?	–	+	1 workshop practice 233 patients (34%)	+	?
Chodosh ^a (USA, 2006)	Cluster RCT	– (absent)	?	+	+	66 PCPs (28%)	–	Intervention participants attended to a mean of 2 (median 1) of 5 seminars
Vickrey ^a (USA, 2006)	Cluster RCT	– (absent)	+	+	+	10 patients (2%)	+	Intervention participants attended to a mean of 2 (median 1) of 5 seminars
Vollmar (Germany, 2007)	Cluster RCT	+	+	+	+	5 GPs (4%)	+	100%
Rondeau (France, 2008)	Cluster RCT	– (absent)	?	+	+	Suspicion 85 patients (3%) Detection 2160 patients (71%)	+	?

RCT, randomised controlled trial; CBA, controlled before and after study; GP, general practitioner; PCP, primary care provider.

+, criterion fulfilled; –, criterion not met; ?, unclear/criterion not clearly addressed.

^aPapers about the same study (ACCESS-trial).

most common limitations of the selected studies were the large proportions of participants lost to follow-up (3–71%) and the poor complete compliance to the intervention (18–100%). Other significant limitations included differences in or absence of baseline measurement. A common strength in all selected studies was that the researchers adequately protected their control groups from contamination by using cluster randomization or by selecting distant intervention and control regions. Most studies blinded the assessors of the primary outcomes.

Outcomes

Table 3 presents an overview of the outcome measures and results of the selected studies. Outcomes are reported according to the levels of effectiveness for research in education (Box 2) (Belfield *et al.*, 2001).

Health care outcomes

Patients and caregivers

One paper described patient and caregiver outcomes at 12 and 18 months after the start of the intervention that included both education and structured care management (Vickrey *et al.*, 2006). In intervention clinics, they found better health-related quality of life and better overall quality of health care in patients, better informal caregiving quality, better social support and more informal caregivers, who reported receiving all help that they needed. Caregiver health-related quality of life did not differ.

Health professionals' behaviour, performance or practice

Dementia detection

Two papers described the effects of educational interventions on dementia detection (Downs *et al.*, 2006; Rondeau *et al.*, 2008). Downs reported higher proportions of patients newly diagnosed with dementia in a workshop group and in a computerized DSS than in a control group. The use of an editorial CD-ROM did not improve detection rates. However, the difference in detection of dementia in the workshop group may be explained by a baseline difference: in the intervention group, a significantly higher number of patients lived in residential care than in the DSS and control group.

Rondeau found higher rates of 'suspected dementia' diagnoses after a 2-h seminar for GPs compared with a control group, and lower rates 'uncertain' and 'non-suspected' diagnoses. An increase in established dementia diagnoses was not found, possibly because of the fact that only 15% of the total of 3021 patients agreed to see a specialist.

Adherence to guidelines

Three papers reported on the effect of educational interventions on adherence to dementia guidelines (Waldorff *et al.*, 2003; Downs *et al.*, 2006; Vickrey *et al.*, 2006). Downs' study showed that three different interventions for GPs did not significantly improve adherence to guidelines measured using *ad hoc* constructed quality indicators. Vickrey's study used validated quality indicators on dementia management. It showed that both the mean compliance per patient to the total set of 23 quality indicators, and the compliance per indicator for 21 of 23 quality indicators, were better in intervention clinics than in control clinics. However, the intervention included both an education component and appointment of dementia care managers. Waldorff's study reported no differences between the intervention and the control region in the number of diagnostic evaluations performed, and in the number of diagnostic cognitive tests used before and after a multi-faceted intervention for GPs.

Learning or knowledge

Knowledge

Two papers reported on PCPs' knowledge (Chodosh *et al.*, 2006; Vollmar *et al.*, 2007). Both studies used *ad hoc* constructed instruments to measure dementia knowledge. Vollmar's study showed that a 5-h seminar for GPs resulted in more knowledge gain than a 3-h seminar. Chodosh *et al.* found better knowledge after an intervention that combined a series of seminars with structured dementia care management. After 9 months, more intervention than control group PCPs correctly answered two questions about decision-making. The scores of both groups did not differ in three items on delirium, safety and depression.

Attitudes

One paper studied PCPs' attitudes towards dementia care. PCPs indicated their agreement with three statements on a Likert scale from 1 (strongly disagree) to 6 (strongly agree) 9 months after a series of seminars and implementation of structured dementia care management. Intervention participants more strongly supported the statement 'Older patients with dementia are difficult to manage in primary care'. No differences in attitudes towards dementia screening and towards physicians' abilities to improve patients' quality of life were found.

Discussion

This systematic review of the literature showed moderately positive effects of educational interven-

Table 3 Outcome measures and results

Level of effectiveness and outcomes	First author (country, publication year)	Method of measurements	Results (intervention vs. control group)
Patient health related quality of life Patients' overall health care quality Caregiving quality Caregiver health-related quality of life Social support Receiving as much help as needed	Vickrey ^a (USA, 2006)	Health care outcomes Health utilities index mark 3 (0–1) Caregiver rating (0–10) Caregiver confidence (0–100) Mastery of caregiving (0–100) EuroQol-5D (caregivers) (0–1) Mean caregiver-attributable health strain (0–100) MOS social support survey (0–100) Caregivers rating (yes/no, %)	After 12 months: NS. After 18 months: 0.10 vs. 0.03, $p = 0.034$ After 12 months: 8.1 vs. 7.6, $p = 0.01$. After 18 months 8.2 vs. 7.9, $p = 0.003$ After 12 months: 64.6 vs. 59.5, $p = 0.001$. After 18 months: 67.2 vs. 60.3, $p = 0.001$ After 12 months: NS. After 18 months: 63.7 vs. 56.7, $p = 0.010$ NS NS After 12 months: NS. After 18 months: 70.0 vs. 64.7, $p = 0.029$ After 12 months: 44.0 vs. 24.7, $p = 0.009$. After 18 months: 47.2 vs. 29.0, $p = 0.012$
Adherence to guidelines Dementia detection	Waldorff (Denmark, 2005) Downs (UK, 2006) Vickrey ^a (USA, 2006) Downs (UK, 2006) Rondeau (France, 2008)	Health professionals' behaviour, performance or practice From verification questionnaires Increase of number of diagnostic evaluations Increase of use of cognitive tests <i>Ad hoc</i> constructed QIs from medical records Validated QIs from medical records and by questionnaires Mean compliance per patient to total set of 23 QIs Compliance per indicator From medical records Classification by GP: Suspected Uncertain Non-suspected (Specialist) diagnosis dementia Learning and knowledge	NS NS NS 63.9% vs. 32.9%, $p < 0.001$ Better compliance with 21 of 23 quality indicators ($p < 0.013$) After workshop 31% vs. 11%, $p = 0.02$ After decision support system 30% vs. 11%, $p = 0.01$ After using tutorial CD-ROM: NS 36.4% vs. 26.8%, $p < 0.001$ 45.6% vs. 50.9%, $p = 0.004$ 18.0% vs. 22.3%, $p = 0.004$ NS Correct: 27% vs. 13%, $p = 0.02$ NS NS NS
Knowledge	Chodosh ^a (USA, 2006)	5-item questionnaire (correct/incorrect) Decision-making (2 items) Delirium Safety Depression	

(Continues)

Table 3. (Continued)

Level of effectiveness and outcomes	First author (country, publication year)	Method of measurements	Results (intervention vs. control group)
Attitude	H. Vollmar (Germany, 2007) Chodosh ^a (USA, 2006)	Knowledge gain: pretest and posttest with pilot-tested questionnaire with 20 multiple choice questions on dementia 3-item questionnaire (6-point Likert scale, 1 = strongly disagree and 6 = strongly agree) Dementia is difficult to manage in primary care Older patients should have dementia screening Possibilities to improve patients' quality of life	5.1 ± 2.3 vs. 2.0 ± 1.9, <i>p</i> < 0.001 4.6 vs. 4.1, <i>p</i> = 0.03 NS NS

NS, not significant; QIs, quality indicators.

^aPapers about the same study (ACCESS-trial).

tions on dementia diagnosis and management in primary care. Educational interventions, which involved active PCPs participation, tended to improve detection of dementia. Adherence to dementia guidelines and patients' and caregivers' quality of life improved when an educational intervention was combined with dementia care management. So far, educational interventions proved to have little or only short term influence on knowledge of and attitude towards dementia.

Only one of the six studies included did not find any effects of the intervention (Waldorff *et al.*, 2003). This may mainly be caused by three important methodological limitations: poor intervention compliance, baseline differences between the study groups and high drop-out rates.

Effects at the level of 'healthcare outcomes', like better quality of care for patients and their informal caregivers, were only found when the intervention included both education and structured care management (Vickrey *et al.*, 2006). It is, however, unclear to what extent the educational component of the intervention contributed to these outcomes.

Effects at the level of 'health professionals' behaviour, performance or practice' were most frequently evaluated in the studies included, as is common in medical education literature (Belfield *et al.*, 2001). However, good 'behaviour, performance or practice' does not automatically guarantee improvement at the level of 'health care outcomes' (Davis *et al.*, 1995). For instance, previous research showed that doctors' communication skills substantially influenced patients' satisfaction (Jung *et al.*, 1998). Those kind of qualities are usually not incorporated in evidence-based guidelines. The fact that guideline adherence only improved when educational intervention was combined with structured dementia care management (Vickrey *et al.*, 2006) may suggest that for improvement of performance quality of dementia care, educational interventions alone are insufficient.

The reliability of effects of seminars on 'learning or knowledge' was limited, either because of a very short follow-up (Vollmar *et al.*, 2007) or because of the absence of baseline measurement (Chodosh *et al.*, 2006). The counterintuitive finding of Chodosh *et al.*, that PCPs in intervention clinics considered dementia patients more difficult to manage than PCPs in the control clinics, may be explained by higher workload on account of new protocols and structural care management, and by more realistic views of intervention group PCPs on the complexity of dementia management.

Usually, multi-faceted educational interventions for PCPs are more effective than single-component interventions (Grol and Grimshaw, 2003). The fact that in the reviewed studies, multi-faceted interventions did not show better results than single-component interventions may have been due to the fact that in the two trials with multi-faceted interventions, compliance to the intervention was extremely poor. This review showed that dementia training programs for PCPs are most effective, when they require participants' active learning. This finding is supported in a number of studies on effective implementation strategies (Sohn *et al.*, 2004).

Strengths and limitations

Important strengths of this review are the following. We used a validated and sensitive search strategy to identify possibly eligible reports, which minimizes the chance to miss relevant studies. Sensitivity is demonstrated by the high number of retrieved citations and by the high percentage of exclusion of citations by screening (>95%). We used standardized criteria for data extraction and assessment of methodological quality, specially developed for studies that evaluate complex interventions aimed at improving the quality of health care (Bero *et al.*, 2008). The results reported in this review are congruent with generally accepted theories and empirical findings from studies on learning processes and methods (Grol and Grimshaw, 2003; Sohn *et al.*, 2004). Major strengths and weaknesses of the studies selected are clearly pointed out. This review also has some limitations. The number of eligible reports was relatively small and some of the studies included suffered from serious methodological limitations. The intervention components were heterogeneous across the studies, as were the outcome measures, which made the performance of meta-analysis inappropriate. However, these obstacles did not come unexpected, as it is generally considered to be difficult to collect reliable evidence in studies that investigate the effects of educational interventions (Norman, 2000). Despite the limitations, this review showed that educational interventions can contribute to overcoming dementia under-detection. Therefore, it has important implications for future policy and research.

Implications for future policy and research

National health care authorities that wish to 'raise GPs' awareness' may use the results of this review to initiate

comprehensive programs to 'train GPs in detecting early dementia' (Burns and Robert, 2009). Reports of patients' general reluctance to visit a specialist for assessment of their memory problems (Rondeau *et al.*, 2008) once again underlines the need to empower and educate GPs to diagnose and manage dementia patients. Patients' massive rejections of specialist interference also call for improvement of public awareness and understanding of the benefits of early dementia diagnosis.

An important factor moderating the effects of educational interventions appears to be poor intervention compliance (Waldorff *et al.*, 2003; Chodosh *et al.*, 2006; Vickrey *et al.*, 2006). Poor intervention compliance may reflect suboptimal motivation to change. To facilitate quality improvements in primary dementia care, also in PCPs that are unwilling to change, educational interventions should be combined with other implementation methods. For instance, a social network strategy involving motivated colleagues may improve PCPs' compliance and thereby also the magnitude of change (Grol and Wensing, 2004). Furthermore, organizational interventions, like improvement of diagnostic and social referral services or appointment of dementia care managers, as well as financial strategies, like payment for attending a training or adequate reimbursement for the care provided, could contribute to behavioural change in daily practice (Grol and Wensing, 2004; Downs *et al.*, 2006; Vickrey *et al.*, 2006).

In this review, study outcomes reflect only three of the five possible outcome levels in medical education research (Box 2). However, in order to understand the mechanisms of change at the most relevant health care level, the effects of an educational intervention should be studied on all five levels simultaneously (Belfield *et al.*, 2001). Currently, we are conducting a randomized clinical trial combined with a qualitative study (Perry *et al.*, 2008), in which we incorporate and analyse outcomes at all five levels. These kinds of studies may help shaping effective complex educational interventions (Lewin *et al.*, 2009).

Conclusion

Educational interventions for PCPs that require active learning and participation can contribute to overcoming under-detection of dementia in primary care. To improve the quality of dementia care in primary care setting, educational interventions need to be combined with social network strategies, with financial

Key points

- Educational interventions for PCPs that require active participation improve detection of dementia.
- Organizational and financial strategies are needed to further improve the quality of primary dementia care.
- PCPs do not often attend educational interventions about dementia.

reimbursement for both training participation and quality of care, with protocols for structured care management, and with increasing public awareness and understanding of the benefits of early dementia diagnosis.

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Authors' contributions

M. Perry was responsible for the research question and the design of this study, participated in the selection of articles and the extraction of data, wrote the first draft of the manuscript and was responsible for revisions. I. Drašković commented on the design, participated in the selection of articles and the extraction of data, contributed to the drafting of the manuscript and the revisions. P. Lucassen advised on the search strategy, critically commented on the manuscript. M Vernooij-Dassen advised on the search strategy, critically commented on the manuscript. T. van Achterberg advised on the search strategy, critically discussed and commented on the manuscript and its revisions. M. Olde Rikkert advised on the search strategy, commented on the design and contributed to the drafting of the manuscript.

Conflict of interest

All authors state that they have nothing to declare. The study sponsors did not influence the study design,

the collection, analysis and interpretation of data, the writing of the report or the decision to submit the report for publication.

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