Use of preventive home visits by general practitioners in patients diagnosed with dementia

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ABSTRACT

INTRODUCTION: The prevalence of dementia is estimated to increase due to a growing elderly population. Patients with dementia are vulnerable as they are less likely to consult their general practitioner (GP). According to Danish guidelines, they are considered frail and in need of a proactive approach in the form of an annual preventive home visit (PHV). The aim of this study was to describe and analyse the use of PHVs among patients with dementia in general practice.

METHODS: This was a quantitative descriptive quality assurance study of elderly patients (≥ 75 years) identified with dementia by their GP. During a four-week audit in 2015, 40 general practices registered all elderly patients who saw their GP or received a home visit, using a registration form addressing frailty characteristics.

RESULTS: The study included 3,098 elderly patients among whom 214 had been identified with dementia. Patients with dementia received more PHVs than dementia-free patients. Even so, more than 60% of the patients with dementia had not received the recommended PHV within the past year. Walking distance < 100 m and > 1 chronic disease alongside dementia were associated with receiving a PHV. Substantial variation was found among the general practices with regard to conducting PHVs.

CONCLUSIONS: GP's adherence to guidelines for patients identified with dementia leaves room for improvement as a significant part of the patients had not received the annual PHV as recommended in the guidelines. Furthermore, substantial variation between general practices indicates that not all GPs need to improve to the same extent.

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TRIAL REGISTRATION: not relevant.

Around 47 million people worldwide have dementia, and 9.9 million new cases are diagnosed every year [1]. In Denmark, around 87,000 people are suffering from dementia, and this number will increase due to a growing population of elderly people [2].

Patients with dementia constitute a vulnerable group as they are less likely to turn to the healthcare system and consult their general practitioner (GP) than those who have not been diagnosed with dementia [3, 4]. Danish clinical guidelines from The Danish College of General Practitioners (DSAM) and the Danish Health Authority consider patients with dementia to be frail and recommend that they are offered a proactive medical and municipal follow-up with regular appointments [3, 5]. The guidelines also recommend that all frail patients should receive an annual preventive home visit (PHV) from their GP in addition to the regular appointments [5]. While recent research has shown conflicting results on the benefits of PHVs [6], these guidelines remain the present gold standard for GPs. However, it is unknown to which extent GPs adhere to the guidelines by paying PHVs to Danish elderly patients with dementia or which factors influence whether these PHVs are conducted or not. Therefore, the aim of this study was to describe and analyse GPs use of PHVs among patients identified with dementia.

METHODS

Study design

A quantitative, descriptive quality assurance study of elderly patients (≥ 75 years) identified with dementia by their GP based on data from Audit Project Odense (APO) [7].

Setting

The Danish healthcare system grants free access for the Danish population, and most examinations and treatments are free of charge [8]. Approximately 3,600 GPs serve the Danish population [9]. On average, Danes aged 75+ years have approximately 16 annual healthcare contacts including clinic consultations, home visits and telephone consultations [10].

The audit process of Audit Project Odense

The APO is a research centre for quality development and continuing education in general practice. The audit process of the APO consists of prospective registration of frequently occurring topics in general practice.

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FIGURE 1

English version of the registration form developed by the Audit Project Odense.

Participant: Audit: The elderly patient (≥ 75 years) Audit Project Odense 2015

Date: 15

	Age	Sex		Contact		Contact cause			Impaired senses			Impaired mobility				Chronic disease						Miscellanous						Loneliness			Medicine									
				1 X		1 X			Max. 2 X			1 or more X				1 or more X						1 or more X						Max. 2 X			1 or more X									
				Consultation	Visit	New health problem	Control of known health problem	Other	Impaired vision	Impaired hearing	None of the above	Walking distance < 100 meters	Fall < 1 year	Difficulty rising from a chair	None of the above	Dementia	Cardiovascular disease	Diabetes	COPD	Depression	None of the above	Municipal home care < 1 year	Preventive home visit < 1 year	Hospitalisation < 1 year	Medicine review < 1 year	None of the above	Living alone	Feeling lonely	None of the above	Sleeping medication	Benzodiazepine	Antidepressives	NSAID	Paracethamol	Strong opioids	Weak opioids	More than 5 daily drugs	None of the above		
		M	F	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35		
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COPD = chronic obstructive pulmonary disease; NSAID = nonsteroidal anti-inflammatory drugs.

A data collection registration form (RF) specifically designed to register data for a given audit is completed by the GP and staff in the general practice provided certain inclusion criteria are met. Prior to the audit period, the RF is tested with a small group of GPs and revised as necessary [11].

The present audit

Patients aged 75+ years consulting general practice or receiving a home visit were included in this audit. The RF was in Danish and was developed by the APO (see **Figure 1** for a translated version). The items in the RF intended to address frailty characteristics according to the DSAMs guideline on treatment of elderly patients [5]. The RF covered the following dimensions: Impaired senses and mobility, chronic diseases, healthcare services within one year, PHV, medication reconciliation, hospitalisations, and whether the patient was lonely and used certain medications or was subject to polypharmacy (use of > 5 drugs). Prior to the audit period, the RF was pilot tested among ten GPs.

Study population

All 1,089 listed clinics in two Danish regions were invited to participate in the audit and 40 general practices accepted. Registration material was sent by conventional mail.

Data collection

During a four-week audit period in the spring of 2015, the GPs and their staff filled out a registration form for each patient aged 75+ years who was seen at the clinic or received a home visit. The registration was conducted only once per patient. The registration form was filled out based on the GP and staff's prior knowledge of the patient. For this purpose, they used medical records, their assessment of the patient's appearance and/or asked the patient.

However, the GP's approval was required for items relating to medication. Patients were registered as having dementia if they were identified with dementia in the GP's medical records. A guide was provided for the general practices alongside the registration form.

Furthermore, a hotline provided by the APO was available if the practices had any questions.

Healthcare services

Preventive home visit

An annual PHV is considered a proactive approach intended for frail elderly people usually aged 75+ years, and it is performed by the GP. The purpose of the proactive visit is to achieve insight into the elderly's resources and their level of activities of daily living; to identify, prevent and limit any emerging health problems; to assess and review the patient's medications; and to gain knowledge of the elderly patient's daily life [12]. This visit by the GP does not resemble other home visits performed by the municipality.

Medication reconciliation

According to the Danish Health Authority, medication reconciliation is a procedure that ensures a comprehensive and real-time overview of the medication actually taken by the patient compared with the prescribed medication. This ensures compliance between the medication the patient is taking and the medication on the medical records [8].

Medication review, on the other hand, is a systematic and critical review of the medication with the purpose of optimising the medication [13]. A medication review is a mandatory part of a PHV [12].

Hospitalisation

In the registration form, the term hospitalisation includes any hospitalisation within a year, but not outpatient visits to the hospital. The registration form provides no information about why or how many times a patient has been hospitalised, nor about the length and frequency of hospitalisations.

Statistical analysis

Descriptive analyses were performed using the two-sample t-test and the chi-squared test. Logistic regression was used to assess factors influencing whether PHVs were conducted among patients identified with dementia. Two-sided p values lower than 0.05 were considered statistically significant.

Trial registration: not relevant.

RESULTS

Characteristics of the participating general practices

A total of 40 general practices (42.5% single-handed practices) participated in the audit. The mean age of the GPs was 55.4 years and 39.8% of the GPs were women [7].

Patient characteristics

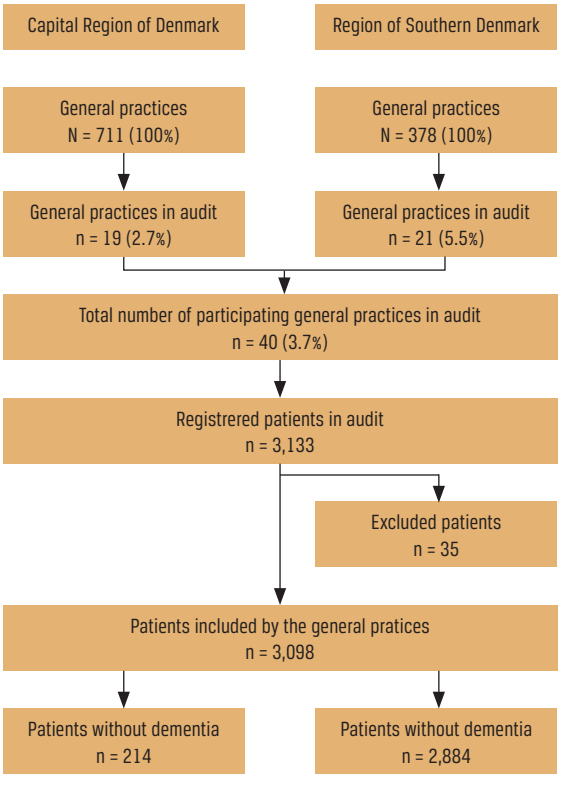
During the audit period, the 40 participating general practices registered 3,133 elderly patients, and 3,098 elderly patients were included. A total of 214 patients were identified with dementia. Please refer to **Figure 2**. The patients' age ranged from 75 to 100 years. Patients identified with dementia were older (median age of 84 versus 81 years, $p < 0.001$) and more frequently women (64.0% versus 56.3%, $p = 0.027$). Additionally, significantly more patients with dementia were registered with a home visit. Patients identified with dementia also had reduced mobility, severely impaired hearing, more depression and were more often subject to polypharmacy (**Table 1**).

Use of healthcare services

Patients with dementia received significantly more municipal home care (66.8% versus 17.3%, $p < 0.001$), PHVs (37.9% versus 8.7%, $p < 0.001$) and medication reconciliations (84.1% versus 70.6%, $p < 0.001$) than patients without dementia (**Table 2**). Furthermore, they had more often been hospitalised (29.0% versus 20.5%, $p < 0.001$).

FIGURE 2

Flow chart of the inclusion process of the participating general practices and the elderly patients.



Preventive home visit

The logistic regression analysis of patients identified with dementia demonstrated that only walking distance < 100 m (odds ratio (OR) = 4.43, 95% confidence interval (CI): 2.19-8.91; p < 0.001) and > 1 chronic disease alongside dementia (OR = 3.12, 95% CI: 1.25-7.78; p = 0.015) were associated with receiving a PHV (**Table 3**).

TABLE 1

Characteristics of elderly patients identified with dementia and dementia-free patients in the participating general practices.

	Patients diagnosed with dementia (n = 214)	Dementia-free patients (n = 2,884)	p-value[a]
Age, yrs, median (range)	84 (75-98)	81 (75-100)	< 0.001
Gender, %			
Female	64.0	56.3	0.027
Type of contact at registration, %			
Consultation	59.3	90.9	< 0.001
Home visit	39.7	8.0	< 0.001
Living alone, %	48.6	48.3	0.933
Mobility, %			
Walking distance < 100 m	56.1	20.5	< 0.001
Fallen within 1 yr	29.9	11.3	< 0.001
Difficulty rising from a chair	33.6	12.4	< 0.001
Senses, %			
Severely impaired vision	4.7	5.1	0.785
Severely impaired hearing	17.3	10.6	0.003
Severely impaired vision and hearing	23.4	9.36	0.051
Chronic disease: selected diseases, %			
Cardiovascular disease	45.8	50.8	0.158
Diabetes	13.1	17.4	0.103
COPD	8.4	12.7	0.067
Depression	20.6	9.3	< 0.001
Medication: selected medications, %			
Benzodiazepine	7.0	5.2	0.266
Tranquiliser	7.5	9.9	0.252
Antidepressant	33.2	10.1	< 0.001
NSAID	3.3	4.4	0.445
Paracetamol	44.4	34.6	0.004
Opioid	17.7	11.5	0.007
Polypharmacy: > 5 types of medications, %	51.9	44.9	0.049

COPD = chronic obstructive pulmonary disease, NSAID = nonsteroidal anti-inflammatory drug.
a) 2-tailed test.

TABLE 2

Use of healthcare services among elderly patients identified with dementia and dementia-free patients in the participating general practices. The values are %.

	Patients identified with dementia (n = 214)	Dementia-free patients (n = 2,884)	p-value[a]
Municipal home care within 1 yr	66.8	17.3	< 0.001
Preventive home visit within 1 yr	37.9	8.7	< 0.001
Medication reconciliation within 1 yr	84.1	70.6	< 0.001
Hospitalised within 1 yr	29.0	20.5	0.003

a) 2-tailed test.

Variation among general practices

Of the 40 participating general practices, 33 identified at least one patient with dementia. The number of patients identified with dementia varied from one to 24 across the general practices. Furthermore, the results showed a variation from 0-100% on whether PHVs were conducted. Specifically, 39.4% of the general practices conducted PHVs among less than or equal to 25% of their patients with dementia, and only 15.2% of general practices conducted PHVs among more than 75% of their patients with dementia. Of the 39.4% of general practices conducting PHVs with less than or equal to 25% of their patients, the majority did not conduct any PHVs at all.

DISCUSSION

Firstly, more than 60% of the included patients diagnosed with dementia had not received a PHV within a year. Secondly, receiving a PHV among this group of patients was associated with frailty characteristics in terms of reduced mobility (walking distance less than 100 m) and more than one chronic disease alongside dementia. Lastly, substantial variation was found among the general practices with regards to conducting these PHVs among patients identified with dementia.

To our knowledge, this is the first study to investigate PHVs in the management of patients with dementia in general practice. Previous studies have reported data on PHVs among elderly patients in general, but not specifically among patients with dementia [7, 14-17].

This study showed that patients identified with dementia received significantly more healthcare services within a year, including municipal home care, PHVs, medication reconciliations and hospitalisations than patients who had not been identified with dementia. However, more than 60% of these patients had not received the recommended annual PHV [5], indicating a potential for improvement in general practice in the management of patients identified with dementia. However, the substantial variation found suggests that not all general practices need to improve to the same extent.

The identification of considerable variation is in accordance with a British study that found close to an eightfold variation in home visits among general practices [18]. In addition, seven of the 40 general practices in our study did not report having any patients with de-

mentia during the four-week audit period. Given that the prevalence of dementia in the Danish population is estimated at 6% [19], this could be indicative of dementia being underdiagnosed in some of the participating practices. As the purpose of this study was to investigate how patients already identified with dementia were managed, the tendency to underdiagnose dementia does not directly affect the results.

According to Danish guidelines, frail patients like those with dementia should receive a PHV annually. However, our study found that only patients with reduced mobility and more than one chronic disease alongside dementia tended to receive a PHV as recommended. Previous research has shown that PHVs are associated specifically with improved functional ability [20], so it is appropriate for GPs to focus on reduced mobility. However, following the guideline more thoroughly is important as there is scope for improving many factors affecting the quality of life, morbidity and the risk of hospitalisation [3, 5]. These factors include reduced physical activity, change in functional ability, tendency to fall, many chronic diseases and hospitalisations, impaired senses and side effects of medications [3, 5].

Strengths and limitations

Firstly, a main strength of the present study is that it consecutively included all patients aged 75 years and older who consulted their GP or received a home visit, and there were no exclusion criteria. This approach to inclusion is unique as it gives a complete picture of a heterogeneous group in a real-life setting. Secondly, the GPs had access to all the required information regarding the patients as they had prior knowledge about the patients and access to medical records including all their contacts as well as records of hospitalisations, pharmaceutical treatment and correspondence with the municipal home care.

There were, however, also several limitations. Firstly, there is a risk of selection bias at both patient level and concerning the general practices. Although general practices were encouraged to include all elderly patients consecutively, we cannot validate if this was actually the case. Furthermore, only 3.7% of the general practices in the two regions participated in the audit. Consequently, the results may not be representative for Denmark. However, data were collected as part of a quality improvement project and were never meant to be representative to this degree. As participation was voluntary, there is a possibility of overrepresentation of GPs with a special interest in improving care for elderly patients. This may have caused the study to overestimate the frequency of PHVs, as the participating GPs may have been more aware of the relevant guidelines. Consequently, the results should be interpreted as a trend among the participating general practices and among all general practices in Denmark, albeit any such interpretation commands caution. Additionally, it is possible that some general practices might not have honoured the requirement of the annual PHV on the exact date and are therefore counted as not having conducted the PHV during the past year.

Although the GPs had prior knowledge of the patients and access to all relevant medical records, the GP and staff might have filled out the registration form incorrectly in some cases. The provided guide for the registration form along with the hotline from APO should, however, have reduced the risk of this. Furthermore, a patient was registered with dementia if the GPs medical records stated so. There was, thus, a risk of patients being identified with dementia although they did not, in fact, meet the specific requirements for this diagnosis or vice versa. To address this limitation, we could have made it a requirement that a specialist should have provided the diagnosis. However, the aim of this study was to investigate whether GPs conducted the required annual PHVs whenever a patient was registered with dementia. How the diagnosis was obtained and the preciseness of the diagnosis were therefore not directly relevant.

Thirdly, this study is a retrospective audit study limited to exploring cross-sectional variation and analysing statistical associations between PHV and a set of GP-reported frailty characteristics which were not validated. Finally, it is also a limitation that this study fo-

TABLE 3

Logistic regression model assessing associations between patient characteristics and preventive home visits within one year among elderly patients identified with dementia (pseudo R^2 = 0.103).

	Odds ratio (95% CI)	p-value[a]
Age, yrs		
75-79 (ref.)	1	-
80-84	1.21 (0.49-2.95)	0.679
85-89	1.37 (0.54-3.48)	0.503
≥ 90	1.46 (0.53-4.07)	0.465
Gender: female	0.91 (0.48-1.72)	0.772
Severely impaired vision and hearing	1.63 (0.25-10.86)	0.611
Walking distance < 100 m	4.43 (2.19-8.91)	< 0.001
Fallen within 1 yr	0.76 (0.36-1.58)	0.463
Hospitalised within 1 yr	1.35 (0.64-2.86)	0.433
Chronic diseases		
No chronic diseases besides dementia (ref.)	1	-
1 chronic disease alongside dementia	1.99 (0.98-4.09)	0.058
> 1 chronic disease alongside dementia	3.12 (1.25-7.78)	0.015
Polypharmacy: > 5 types of medications	0.76 (0.40-1.44)	0.399

CI = confidence interval.
a) 2-tailed test.

cused on PHVs conducted by GPs. Another more comprehensive approach could be to use overall "home visits" including outreach and follow-up visits. However, this alternative approach would require a different study design that ideally also included more covariates such as organisational characteristics, distance from practice, measures of GP attitudes, GP cooperation with the home care system and GP patient population characteristics.

CONCLUSIONS

General practitioners' adherence to guidelines with patients identified with dementia can be improved as evidenced by the fact that a significant part of the patients had not received the annual preventive home visit recommended in these guidelines. Furthermore, the use of PHVs among elderly patients with dementia varies substantially between general practices, indicating that not all need to improve to the same extent.

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