

PEER-REVIEWED ARTICLE

The role of Parkinson's nurses and their care of patients with Parkinson's disease and other forms of parkinsonism: a survey

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Background: Patients with parkinsonian disorders experience complex motor and non-motor symptoms that can affect their daily functioning and quality of life. Parkinson's nurses play an important role in the multidisciplinary care of these patients. In Norway, Parkinson's nurses are part of the specialist health service and they have the competence to support patients throughout the course of their illness. International studies have shown that Parkinson's nurses have a positive impact on patients' quality of life. Nevertheless, there is limited research examining the role and function of the Parkinson's nurse in a Norwegian context.

Objective: We sought to map the extent to which patients with Parkinson's disease and other forms of parkinsonism receive care from a Parkinson's nurse. We also aimed to investigate the role and function of Parkinson's nurses for this patient group within South-Eastern Norway Regional Health Authority.

Method: This is a cross-sectional study based on secondary data from a questionnaire survey conducted by ParkinsonNet. Patients with Parkinson's disease or other forms of parkinsonism in South-Eastern Norway Regional Health Authority were recruited through the Norwegian Parkinson's Association (N = 1228).

Results: One-third of the respondents had contact with a Parkinson's nurse. Most hospital catchment areas had a higher proportion of respondents receiving care from a Parkinson's nurse compared with Oslo University Hospital. The proportion was most markedly higher at Innlandet Hospital Trust (odds ratio [OR] 16.89; 95% confidence interval [CI] 9.34–30.55) and Telemark Hospital Trust (OR 25.87; 95% CI 12.68–52.80). In addition, respondents under the age of 40 were more likely to receive care from a Parkinson's nurse than those over 40 (OR 11.6; 95% CI 2.7–49.5). Among respondents who had contact with a Parkinson's nurse, most received assistance with treatment follow-up, information, patient education and telephone consultations. Respondents who had contact with a Parkinson's nurse were less likely to receive follow-up from a neurologist.

Conclusion: This study identified major regional differences in the extent to which patients with Parkinson's disease and other forms of parkinsonism have contact with a Parkinson's nurse in South-Eastern Norway Regional Health Authority. Parkinson's nurses play an important role in the care of this patient group. More knowledge is needed on the role and function of Parkinson's nurses in order to develop more comprehensive health care.

Introduction

Parkinson's disease is the most common form of parkinsonism. It is a progressive, neurodegenerative disorder that affects more than six million people worldwide (1, 2). According to the Norwegian Parkinson's Registry, 11,829 people were registered with Parkinson's disease and 419 with other parkinsonian disorders in Norway in 2023 (3).

The prevalence of Parkinson's disease increases with age (1). The ageing population means that a further increase in the number of cases is expected in the coming years (3, 4).

Parkinson's disease is caused by degeneration of dopamine-producing neurons in the substantia nigra, leading to dysfunction of the basal ganglia and impaired motor control (1). Clinically, the disease manifests with characteristic motor symptoms such as rigidity, resting tremor, bradykinesia and postural instability (see fact box).

FACT BOX

Definitions

Akinesia: Impaired movement characterised by difficulty initiating and executing voluntary movement.

Basal ganglia: Group of subcortical nuclei located deep within the cerebrum. Dysfunction or damage in this area can result in movement disorders.

Bradykinesia: Slowness of movement, ranging from mild impairment to complete immobility.

Postural instability: Impaired ability to maintain posture. Postural changes can lead to altered posture, with reduced balance and increased risk of falls.

Rigidity: Increased resistance to passive movement. In parkinsonism often presenting as ratchet-like resistance (cogwheel rigidity).

Substantia nigra: A midbrain structure with dark appearance that produces dopamine.

Tremor: Involuntary rhythmic oscillation. In parkinsonism typically present at rest.

Source: Dietrichs E, Toft M (1)

Parkinson's disease is associated with a wide range of non-motor symptoms, such as sleep disturbances, depression and cognitive impairment, which can affect functioning and quality of life (1, 5, 6).

The heterogeneous course of the condition requires person-centred, multidisciplinary, long-term care, in which the Parkinson's nurse plays a key role (5–7). International studies show that guidelines for Parkinson's nurses and practices vary (5, 7).

In Norway, Parkinson's nurses are specialist nurses affiliated with neurological departments within the specialist health service. They provide outpatient care and offer telephone consultations (8). A Parkinson's nurse serves as a link between different levels of health care and helps ensure continuity in multidisciplinary care (8).

The 2023 annual report of the Norwegian Parkinson's Registry states that only one-third of patients with Parkinson's disease and other forms of parkinsonism received care from a Parkinson's nurse nationwide (3). A Parkinson's nurse has the competence to support patients throughout the entire course of their illness (9).

The Parkinson's nurse plays an important role in guiding and supporting patients, coordinating responsibility for multidisciplinary care, collaborating with neurologists and helping to improve

patients' health literacy (6, 10, 11). Studies have shown that Parkinson's nurses have a positive effect on patients' well-being and quality of life (5, 7, 12).

In Norway, Parkinson's nurses' competence has long been regarded as an important resource in the multidisciplinary care of this patient group (13, 14). Nevertheless, Norwegian research on the role and function of Parkinson's nurses and their care of patients with Parkinson's disease and other parkinsonian disorders is limited.

Objective of the study

The objective of the study was to map the extent to which patients with Parkinson's disease and other forms of parkinsonism receive care from Parkinson's nurses at the different hospital trusts in South-Eastern Norway Regional Health Authority, as well as to examine the role and function of Parkinson's nurses in relation to this patient group. Our research questions were as follows:

- What is a Parkinson's nurse's role and function in relation to patients with Parkinson's disease and other forms of parkinsonism?
- What proportion of respondents with Parkinson's disease and other forms of parkinsonism have contact with a Parkinson's nurse in South-Eastern Norway Regional Health Authority?
- Is there an association between patient age, disease duration, hospital catchment area, living situation, follow-up by a neurologist, and whether the patient has contact with a Parkinson's nurse?

Method

Design

This is a cross-sectional study, with data based on secondary data from a questionnaire survey developed and conducted by ParkinsonNet. We followed the EQUATOR guidelines, using the STROBE checklist for cross-sectional studies in our reporting (15).

Sample

Members of the Norwegian Parkinson's Association in the South-Eastern Norway Regional Health Authority with a diagnosis of Parkinson's disease or other form of parkinsonism were invited to participate in the survey. Those with an unconfirmed diagnosis were also invited, as this patient group displays symptoms of parkinsonism and requires clinical evaluation and follow-up.

Respondents who consented to participate were included in the study. There were no exclusion criteria for participation, and reminders were sent a total of four times.

Data collection

The survey was conducted in the online Nettskjema platform (16). A link to the questionnaire and an invitation to participate were posted on the Norwegian Parkinson's Association's website and Facebook page. The survey was conducted between December 2022 and February 2023. Of the 2255 people invited to participate, 1228 responded and were included in the study (response rate 54%).

Questionnaire and variables

The survey was developed when ParkinsonNet was commissioned by the South-Eastern Norway Regional Health Authority to identify which occupational groups patients with Parkinson's disease and other parkinsonian disorders receive care from.

The questionnaire and items included were developed for this purpose by ParkinsonNet in a multidisciplinary collaboration. The questionnaire was not validated.

The questionnaire consisted of 47 closed-ended questions with no option for free-text responses. The questions covered participants' sociodemographic characteristics, hospital catchment area and the occupational groups that patients had contact with. We selected the relevant questions relating to Parkinson's nurses and neurologists with a view to addressing the research questions. The following questions from the survey were used:

- What is your age?
- Which county do you live in? Or hospital catchment area?
- How long ago were you diagnosed?
- What is your current living situation?
- How often do you see a neurologist for follow-up of your Parkinson's diagnosis?
- Are you in contact with a Parkinson's nurse at the hospital?
- If not, why do you not have contact with a Parkinson's nurse at the hospital?
- If you are, what does the Parkinson's nurse help you with?

Current living situation and hospital catchment area were treated as nominal categorical variables. For example, current living situation included: *living alone in own home, living in own home with one or more family members, living in assisted housing, living in a nursing home/institution*.

Age, disease duration and follow-up by a neurologist were treated as ordinal categorical variables. For example, age categories were: *under 40 years, 41–54 years, 55–70 years, 71–84 years and over 85 years*.

The outcome variable, *contact with a Parkinson's nurse*, is a dichotomous categorical variable (*yes/no*) (17). Questions about why respondents did not have contact, or what the Parkinson's nurse helps patients with had multiple choice responses.

Statistical analyses

There was no missing data in the study's dataset. We therefore used raw data to analyse the results. Descriptive statistics were employed to describe the sample, with the proportion of patients receiving care from a Parkinson's nurse reported as frequency and percentage. Chi-square tests were used to examine associations between variables.

A logistic regression analysis was performed to investigate the extent to which age, hospital catchment area, disease duration, current living situation and follow-up by a neurologist were associated with the outcome variable *contact with a Parkinson's nurse at the hospital*.

All variables from the unadjusted analyses were included in the regression model. Age was categorised into two groups to examine the odds of follow-up for patients under 40 years, using those over 40 years as the reference group. Statistical analyses were performed using IBM SPSS version 29 (18), with a significance level set at $p \leq 0.05$.

Research ethics considerations

The survey only used anonymous data, as this could not be linked to individual participants directly or indirectly via email, IP addresses or scrambling keys. The use of Nettskjema ensured anonymity (16). Since the study only used anonymous data and no personal data, it was not subject to notification to Sikt – Norwegian Agency for Shared Services in Education and Research (19).

Respondents were informed about the survey and its purpose in an accompanying letter from ParkinsonNet in South-Eastern Norway Regional Health Authority. By completing the questionnaire in Nettskjema, respondents provided their consent to participate.

Results

Table 1 shows the characteristics of the sample (N = 1228). Most respondents reported having Parkinson's disease (87%). The majority were aged 55–84 years (91%). Most lived in their own home, either alone or with at least one family member. Half of the respondents reported a disease duration of 0–4 years.

Ten per cent of respondents received assistance from others to complete the questionnaire, with this proportion increasing with age. Among the over 70s, 78% received help.

Table 1. Characteristics of patients with Parkinson's disease and other forms of parkinsonism in South-Eastern Norway Regional Health Authority (N = 1228)

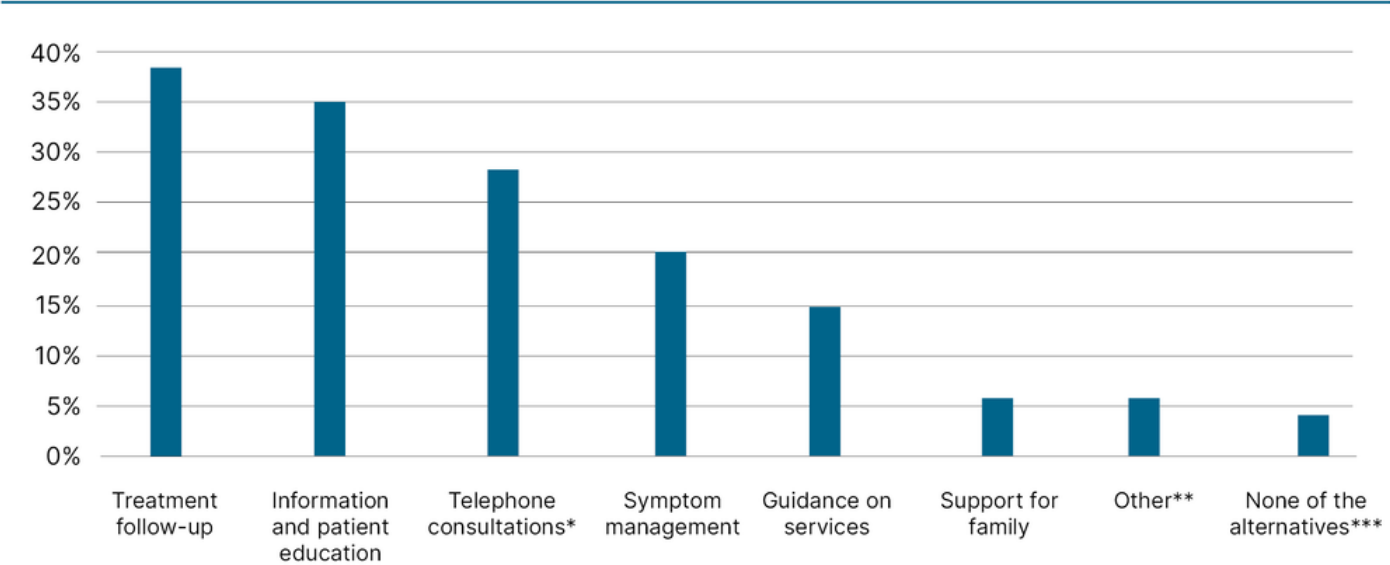
Variable name	n	%
Parkinson's diagnosis		
Parkinson's disease	1073	87.4
Atypical parkinsonism	99	8.1
Unsure/awaiting diagnosis	54	4.4
Don't want to answer	2	0.1
Age		
Under 40 years	10	0.8
41–54 years	70	5.7
55–70 years	516	42.0
71–84 years	605	49.3
Over 80 years	27	2.2
Hospital catchment area		
Vestfold Hospital Trust	158	12.9
Østfold Hospital Trust, Kalnes	201	16.4
Oslo University Hospital	217	17.7
Drammen and Bærum hospitals	195	15.9
Akershus University Hospital	166	13.5
Sørlandet Hospital Trust	110	9.0
Telemark Hospital Trust	70	5.7
Innlandet Hospital Trust	111	9.0
Disease duration		
0–4 years	579	47.1
5–9 years	372	30.3
10 years or more	277	22.6
Current living situation		
Living alone in own home	224	18.2
Living in own home with one or more family members	969	78.9
Living in assisted housing	10	0.8
Living in a nursing home/institution	25	2.0
Who completed questionnaire		
Respondent	1099	89.5
Respondent's representative	129	10.5

Role and function of the Parkinson's nurse

When respondents were asked what the Parkinson’s nurse helped them with, approximately one-third reported receiving treatment follow-up, information, patient education and telephone consultations (Figure 1).

Twenty per cent reported receiving help with managing and coping with various symptoms and challenges associated with the disease. Fifteen per cent reported receiving help to identify and access various services. For some respondents, the Parkinson’s nurse also provided support for their family.

Figure 1. Percentage distribution of the type of help provided by Parkinson’s nurses (n = 400)

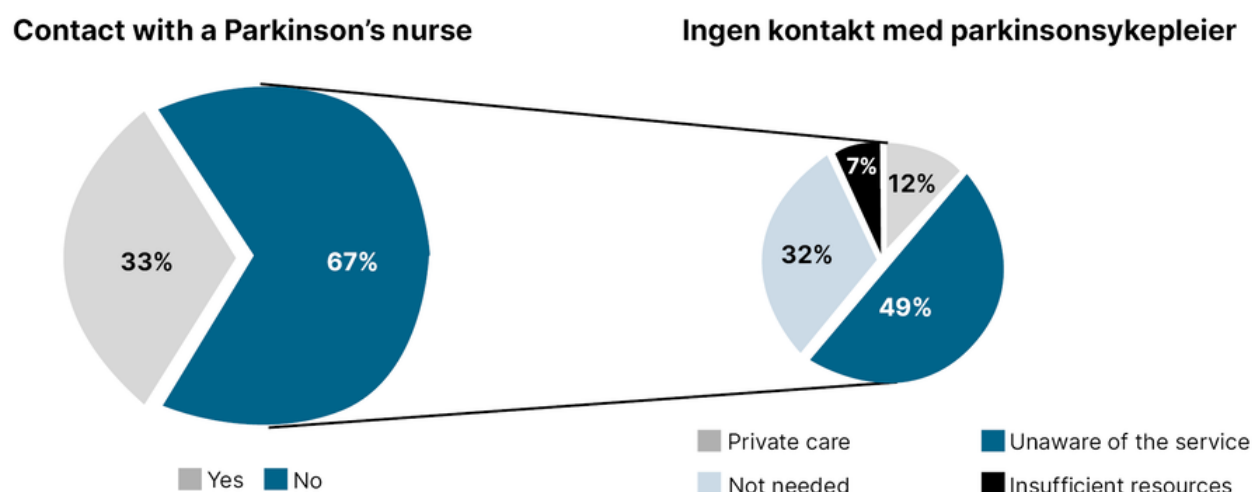


*Telephone consultations: telephone contact with a Parkinson’s nurse.
**Other: the response options do not cover the types of help they receive.
***None of the alternatives: none of the response options are relevant.

Contact with a Parkinson’s nurse

The frequency analysis revealed that only one-third of respondents (n = 400) had contact with a Parkinson’s nurse. Among those who did not have contact, half reported that they were not aware of the service, and 32% indicated that they did not feel they needed follow-up (Figure 2).

Figure 2. Contact with a Parkinson's nurse (N = 1228) and reason for no contact (n = 828)



Unadjusted analyses

The unadjusted analyses showed a statistically significant association between the independent variables *hospital catchment area*, *follow-up by a neurologist* and the dependent variable *contact with a Parkinson's nurse at the hospital* (Table 2). This indicates that the patient's hospital was associated with whether they had contact with a Parkinson's nurse.

The proportion of patients receiving care from a Parkinson's nurse was particularly high at Innlandet Hospital Trust and Telemark Hospital Trust, while the lowest rates were observed at Oslo University Hospital and the hospitals in Drammen and Bærum.

There was also an association between the frequency of follow-up by a neurologist and whether patients received care from a Parkinson's nurse. Among those who were seldom followed up by a neurologist (once a year or less), a higher proportion had contact with a Parkinson's nurse.

No statistically significant associations were found between the independent variables *age*, *disease duration*, *living situation* and *contact with a Parkinson's nurse at the hospital*.

Table 2. Association between contact with a Parkinson's nurse and the independent variables (N = 1228)

Independent variable	Contact with a Parkinson's nurse at the hospital				P-value
	Yes		No		
	n	%	n	%	
Age					
Under 40	7	(70.0)	3	(30.0)	0.067
41–54 years	21	(30.0)	49	(70.0)	
55–70 years	178	(34.5)	338	(65.5)	
71–84 years	187	(30.9)	418	(69.1)	
Over 85 years	7	(25.9)	20	(74.1)	
Hospital catchment area					
Vestfold Hospital Trust	61	(38.6)	97	(61.4)	< 0.001*
Østfold Hospital Trust, Kalnes	75	(37.3)	126	(62.7)	
Oslo University Hospital	28	(12.9)	189	(87.1)	
Drammen og Bærum hospitals	25	(12.8)	170	(87.2)	
Akershus University Hospital	50	(30.1)	116	(69.9)	
Sørlandet Hospital Trust	29	(26.4)	81	(73.6)	
Telemark Hospital Trust	55	(78.6)	15	(21.4)	
Innlandet Hospital Trust	77	(69.4)	34	(30.6)	
Disease duration					
0–4 years	185	(32.0)	394	(68.0)	0.429
5–9 years	116	(31.2)	256	(68.8)	
10 years or more	99	(35.7)	178	(64.3)	
Current living situation					
Living alone in own home	63	(28.1)	161	(71.9)	0.435
Living in own home with one or more family members	324	(33.4)	645	(66.6)	
Living in assisted housing	4	(40.0)	6	(60.0)	
Living in a nursing home/institution	9	(36.0)	16	(64.0)	
Follow-up by a neurologist					
More than twice a year	63	(32.8)	129	(67.2)	0.006*
Twice a year	184	(28.8)	455	(71.2)	
Once a year	120	(39.5)	184	(60.5)	
Less frequently	21	(41.2)	30	(58.8)	

Bivariate analyses for unadjusted variables.

* Chi-square test, $p < 0.05$ is set as statistically significant.

Adjusted analyses

In the multivariable analyses, we adjusted for age, hospital catchment area, current living situation and follow-up by a neurologist (Table 3). Only hospital catchment area and age were significantly associated with the outcome of whether patients had contact with a Parkinson's nurse. We found that patients under 40 years had 11 times higher odds of receiving care from a Parkinson's nurse compared with patients over 40 years (OR = 11.6; 95% CI [2.7–49.5]).

Compared with Oslo University Hospital, patients at all hospitals except Drammen and Bærum had significantly higher odds of receiving care from a Parkinson's nurse. The proportion was notably higher at Innlandet Hospital Trust and Telemark Hospital Trust compared with Oslo University Hospital.

At Innlandet Hospital Trust, the odds of receiving care from a Parkinson's nurse were 16 times higher (OR 16.89; 95% CI [9.34–30.55]), and at Telemark Hospital Trust, the odds were 25 times higher compared with Oslo University Hospital (OR 25.87; 95% CI [12.68–52.80]).

Table 3. Contact with a Parkinson's nurse

	OR	96% CI	P-value
Age			
Under 40	11.61	2.72–49.49	< 0.001
Over 40 [reference]*	1		
Hospital catchment area			
Østfold Hospital Trust, Kalnes	4.26	2.54–7.16	< 0.001
Vestfold Hospital Trust	4.42	2.56–7.61	< 0.001
Drammen og Bærum hospitals	0.99	0.54–1.82	0.982
Akershus University Hospital	2.65	1.52–4.59	< 0.001
Sørlandet Hospital Trust	2.24	1.21–4.13	0.010
Telemark Hospital Trust	25.87	12.68–52.80	< 0.001
Innlandet Hospital Trust	16.89	9.34–30.55	< 0.001
Oslo University Hospital [reference]	1		
Disease duration			
5–10 years	0.93	0.67–1.29	0.678
10 years or more	1.18	0.84–1.67	0.329
0–4 years [reference]	1		
Current living situation			
Living in own home with more than one family member	1.15	0.80–1.66	0.440
Living in assisted housing	1.33	0.32–5.55	0.691
Living in a nursing home/institution	2.10	0.59–7.39	0.247
Living alone in own home [reference]	1		
Follow-up by a neurologist			
Twice a year	0.79	0.52–1.19	0.268
Once a year	1.17	0.74–1.83	0.489
Less frequently	1.18	0.58–2.42	0.637
More than twice a year [reference]	1		

Abbreviations: CI = confidence interval, OR = odds ratio.

* Reference indicates that this is used as a reference category in the analysis, against which all other categories are compared. A logistic regression analysis was performed, with the dependent variable being whether the patient was in contact with a Parkinson's nurse at the hospital (yes/no).

Discussion

In this study, we found that the role and function of Parkinson's nurses in caring for patients with Parkinson's disease and other forms of parkinsonism is multifaceted. Treatment follow-up, information, patient education and telephone consultations were among the most important functions. In South-Eastern Norway Regional Health Authority, only one-third of respondents had contact with a Parkinson's nurse.

Differences in care

Substantial regional differences were identified in the study, with respondents in the catchments areas of hospitals in or near Oslo being less likely to have contact with a Parkinson's nurse. We also observed a significant association with patient age, as a higher proportion of patients under 40 years had contact with a Parkinson's nurse compared with older patients.

Patients who were in contact with a Parkinson's nurse were less frequently followed up by a neurologist (once a year or less) than those without contact.

In a randomised controlled trial, Connor et al. (20) investigated the effect of telephone consultations as an intervention, with nurses serving as a consistent point of contact. They found that telephone consultations provided supportive care and were beneficial when access to specialists was limited (20).

In our study, we also found that several respondents made use of telephone consultations with a Parkinson's nurse. Literature review articles report that Parkinson's nurses make a major contribution to patient education, adherence to medical treatment and the provision of ongoing support when patients encounter difficulties (21, 22). Half of the respondents in our study who did not receive care from a Parkinson's nurse were unaware of the service.

One-third of those without contact with a Parkinson's nurse reported that they did not need follow-up. One possible reason for this is that they may not have been familiar with the role and function of the Parkinson's nurse. More patient knowledge about the work of a Parkinson's nurse may boost the uptake of this follow-up service. Respondents who reported receiving care privately may have had this need met.

To develop more comprehensive health care and address society's growing need for efficiency, more Parkinson's nurses are needed so that care can be offered more widely to patients across all health trusts and hospitals. This finding aligns with the vision of the South-Eastern Norway Regional Health Authority: 'High-quality, equitable healthcare services for all who need them, when they need them' (23, p. 5).

This requires equal access to resources, such as care from a Parkinson's nurse. The specialist health service has a special responsibility to apply its expertise and ensure continued preventive care following disease onset (23). The specialist health service should engage more actively in preventive health care, as this is not solely the responsibility of other parts of the health service (23).

Competence requirements

Increasingly advanced symptomatic treatments are now being offered to this patient group, requiring more specialised care by Parkinson's nurses. Various pump-based therapies and deep brain stimulation (DBS) are examples of advanced treatments that require close follow-up by a multidisciplinary team, in which Parkinson's nurses play a key role (24, 25).

The development of more advanced medical treatments necessitates both specialist and primary care services to provide care and requires a high level of professional competence within these services (26). Another study shows the importance of having clearly defined roles and responsibilities within the patient care pathway (27). Qualitative studies based on interviews with patients with Parkinson's disease have provided insight into patients' experiences and perspectives (12, 25, 28).

Patients emphasise the importance of having access to a Parkinson's nurse with specialised knowledge of the disease, who provides person-centred care and can offer guidance while the patient is under the care of a multidisciplinary team (12, 25, 28). The Norwegian Parkinson's Registry shows high levels of satisfaction among patients who had access to a Parkinson's nurse (3).

We identified major regional differences in the care of patients with Parkinson's disease and other forms of parkinsonism in the South-Eastern Norway Regional Health Authority. Among respondents at Oslo University Hospital, Drammen Hospital and Bærum Hospital, 13% were in contact with a Parkinson's nurse. In Telemark and Innlandet, the corresponding proportions were 79% and 69%, respectively, despite Oslo and Drammen having a higher population density (29).

The Norwegian Parkinson's Registry (3) describes variations in practice and access to Parkinson's nurses across health trusts. These findings are clinically relevant, as they indicate potential differences in the access to care based on hospital catchment area. Although the same level of follow-up care should be expected throughout the country, these findings reveal considerable variation (23, 30).

We found an association between patient age and care from a Parkinson's nurse, with younger patients more likely to receive such care. A possible explanation is that younger patients often have different life circumstances from older patients, as they are more likely to be in employment and have young children. In addition, this group often receives more advanced treatment (31). The need for close multidisciplinary follow-up may therefore be greater in this population (31).

A literature review by van Laar et al. (32) reports that advanced infusion therapies are recommended early in the disease course when motor fluctuations occur. Such treatments require meticulous patient care and patient education (32).

Follow-up by a neurologist

In our study, we found that patients who were followed up less frequently by a neurologist were more likely to have contact with a Parkinson's nurse. There may be several reasons for this, including the need for closer follow-up by a Parkinson's nurse among patients who receive less frequent neurological care.

Another possibility is that a Parkinson's nurse may address some of the patients' needs that would otherwise require a neurologist, reducing the need for frequent follow-up by a neurologist. This finding is supported by a previous literature review (21), which shows that Parkinson's nurses make a major contribution to patient education, adherence to medical treatment, are readily available and provide ongoing support when patients encounter difficulties. By doing so, Parkinson's nurses help relieve the workload of doctors (21).

Patient health literacy

Bloem et al. (4) note that a proactive approach to this patient group is beneficial, allowing preventive measures to be implemented earlier in order to optimise treatment and prevent complications (4, 21).

Parkinson's nurses can help improve patients' health literacy through patient education, equipping them to adhere to prescribed medications, to manage equipment and to recognise symptoms, which can facilitate independence in daily life (23).

Parkinson's nurses provide person-centred care, which is particularly important given the complex and highly individual nature of Parkinson's. These nurses can give specialised advice tailored to each patient (6, 12, 25, 28).

Strengths and limitations of the study

A strength of the study is that the sample was representative in terms of age, living situation and the distribution between Parkinson's disease and other forms of parkinsonism, when compared with data from the Norwegian Parkinson Registry (3).

In the hospital catchment areas within South-Eastern Norway Regional Health Authority, only between 9% and 18% of patients presumed to have Parkinson's disease responded, which may limit the generalisability of the findings. The study included 1228 respondents, and there were no missing data related to the questionnaire. There are few previous studies that have examined the role and function of the Parkinson's nurse in Norway.

This study adds to the existing knowledge base about the care of patients with parkinsonian disorders in a Norwegian context. The questionnaire was not validated, and it is unknown whether the questions were clear and interpreted uniformly, which could impact on the validity of the study (17).

Ten per cent of the questionnaires in the study were completed by someone other than the participant. This facilitated the inclusion of participants who would otherwise have been unable to take part, thereby enhancing sample representativeness. However, differences in the

quality of assistance may have impacted on the responses, for example if the helper misunderstood questions or was not completely objective. It was not possible to control for gender, education or treatment, as these variables were not included in the questionnaire.

The questionnaire was in Norwegian and distributed electronically, which may have excluded respondents with limited digital literacy or who did not understand Norwegian. We also observed that respondents were predominantly patients who had had the condition for four years or less.

As there were no exclusion criteria in the study, we cannot rule out that some respondents may have developed cognitive impairment. We have no data on those who did not participate in the study and are therefore unable to identify the reasons for non-participation.

Conclusion

The findings provide insight into the role and function of the Parkinson's nurse in relation to this patient group. Respondents reported primarily receiving support with treatment follow-up, information and patient education, as well as telephone consultations. Only one-third of respondents reported having contact with a Parkinson's nurse in the South-Eastern Norway Regional Health Authority.

The study shows an association between hospital catchment area, patient age and contact with a Parkinson's nurse, as well as between follow-up by a neurologist and contact with a Parkinson's nurse.

The findings highlight the need for a more uniform approach to the care of patients with Parkinson's disease and other forms of parkinsonism in Norway. Further insight is needed into why the allocation of resources differs between hospital trusts and the implications of the varying levels of care provided by Parkinson's nurses.

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The authors declare no conflicts of interest.

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IMPORTANT ROLE: A Parkinson's nurse provides information, patient education and treatment follow-up. In the photo, Dorte Thomsen, a Parkinson's nurse, is caring for a patient after surgery for Parkinson's disease. The people depicted are not connected to the study participants. *Archive photo: Marit Fonn*

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