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Research Letter

The underdetection of cognitive impairment in nursing homes in the Dublin area. The need for on-going cognitive assessment

SIR—Cognitive impairment (CI) or dementia may now be a major concern of Irish nursing homes (NHs) [1]. In the USA and Europe, between one-half and two-thirds of NH residents are said to have dementia [2–8]. Whilst one should exercise caution in comparing NH populations in different countries, due to large differences existing between facilities, in general private [9], smaller [3] and urban facilities [3] have been shown to have a higher prevalence of residents with dementia.

Diagnosis has been called 'the gateway for care' [11]. Differential diagnosis is also the gateway to appropriate medical and drug treatment. Dementia with Lewy body (DLB) for example must be excluded before commencing anti-psychotic (AP) drugs. In residential care, diagnosis and staffs' assessment of residents' cognitive status is essential for optimal treatments [4, 10]. The absence of knowledge about residents' memory and cognitive status may also seriously compromise care services and quality of life. Mild and moderate dementia are more frequently overlooked than severe [12]. Low expectations of cognitive functioning and the absence of challenging behaviours often hinder staffs' recognition of dementia [4, 10]. One UK study showed that only 34% of residents classified on Mini-Mental State Examination (MMSE) as cognitively impaired were acknowledged by senior nursing staff as having dementia [10]. For those with a severe impairment, a higher number (46.4%) were recognised [10]. In a Danish study, key carer staff [4] correctly identified some 74% of the residents that had a dementia or other brain disorder.

Recent Irish research, based on the 2002 Census, estimated that there were some 14,764 people aged 65 and over living in NHs of whom 85% experienced a disability [13]. Of these, large numbers may have had CI or dementia since 58% had difficulties 'learning, remembering and concentrating'. Regrettably in the Census, no direct question was asked about dementia or CI nor has any recent audit of Irish NHs been undertaken for dementia or CI since. This study was undertaken to address this gap in our understanding and to test a methodology for a future larger national survey of CI across NHs in Ireland.

Methods

Sampling of NHs

All general private and voluntary NHs belonging to the former Irish Health Service Executive East Coast Area (Dublin Mid-Leinster) were sampled. Three areas, namely 1, (Dun Laoire), 2 (Dublin South East) and 10 (Wicklow) which represent the former East Coast Eastern Regional Health Authority provided the sampling frame. Four of the 53 NHs were randomly selected. The chance of a NH being sampled was directly proportional to its size.

Sampling of residents

The total capacity of the four NHs was 187 beds, and at the time of study, 174 beds were occupied. A sample of 100 residents was randomly drawn, 25 from each NH. Oversampling occurred at each facility to allow for refusals (please see Appendix 1 in the supplementary data available on the journal website at http://www.ageing.oxfordjournals.org). Only 18 residents or their next of kin refused participation. The MMSE was administered to all 100 residents.

Ethical considerations

Ethical approval was granted by Trinity College Dublin. Informed consent was obtained in all NHs, and proxy consent got for those residents known to lack capacity.

Instruments

The MMSE was used to assess CI [14]. When used for screening purposes, a cut score of 23/24 is conventionally used for detection of significant impairment. In contrast when the intention is to classify CI severity as was the case in this study, Folstein *et al.* recommendations were followed, i.e. normal cognitive function = 27–30, mild CI (MCI) = 21–26, moderate CI = 11–20 and severe CI = 0–10.

Residents who scored within the normal ranges (MMSE $\geq$ 27) were re-assessed using the Montreal Cognitive Assessment (MoCA) [The MoCA test scores 0–30 points. Scores of 26 or above are considered normal. The MoCA test is a screening instrument for the detection of mild CI. It was developed to discriminate individuals between mild CI and normal cognitive function [15]]. Where residents were classified on the MMSE as severely impaired (MMSE $\leq$ 10), a proxy appraisal (the Dementia Screening Scale, DSS) was completed [The DSS total score varies between 0 and 14 with higher scores indicating worse CI [8]]. Using a Likert scale (no impairment, mild, moderate and severe), Directors of Nursing (DONs) perception of resident's cognitive status was also assessed.

Results

Mean age of residents was 85.1 (range, 63–101 years; SD = 7.97). Most were female (82%), single or widowed (44% and 42%) and well educated (52% with completed secondary or

t1.1 **Table 1**. Cognitive status (as per MMSE assessment) of
t1.2 residents with and without a clinical diagnosis of dementia

t1.3 Cognitive status	Diagnosis (n = 32)	No diagnosis (n = 68)
t1.4 Intact	3% (1)*	15% (10)
t1.5 Mild	3% (1)	27% (19)
t1.6 Moderate	31% (10)	25% (17)
t1.7 Severe	63% (20)	32% (22)

t1.8 *MoCA test classified this resident as MCI.

Table 2. Differences between DONs perceptions of the cognitive status of the residents and MMSE classification t2.1 t2.2

	Intact DoNs	Mild DoNs	Moderate DoNs	Severe DoNs	Total	
Intact MMSE	**34.8%**	13.6%	0	0	11	t2.4
	8	3	0	0		
Mild MMSE	34.8%	**27.3%**	23.8%	2.9%	20	t2.5
	8	**6**	5	1		
Moderate MMSE	21.7%	45.5%	**38.1%**	11.8%	27	t2.6
	5	10	**8**	4		
Severe MMSE	8.7%	13.6%	38.1%	**85.3%**	42	t2.7
	2	3	8	**29**		
Total residents	23	22	21	34	**100**	t2.8

Cohen's Kappa = 0.33. Bold reflects consensus between DoNs' perceptions of residents' CI and our objective assessment (MMSE). t2.9 t2.10

tertiary education). Average length of stay in NHs was 3.3 years (SD = 2.8). No statistical relationship was found between age (r_s = −0.165, n = 100, P = >0.05) or length of stay in the NHs (r_s = −0.173, n = 100, P = >0.05) and level of CI. Main reason for NH admission was medical/non-dementia (32%) such as immobility, falls, depression and other physical reasons. In about one quarter of cases (26%), the individual's inability to live alone precipitated admission. Only 14% of admissions were due to dementia (please see Table Characteristics of the Residents in Appendix 2 in the supplementary data available on the journal website at http://www.ageing.oxfordjournals.org).

Prevalence of CI

Eleven participants scored 27 or above on the MMSE and therefore completed the MoCA of whom only three, when re-assessed, were cognitively intact. Forty-two residents scored 10 or below on the MMSE and therefore required the DSS. Eighty-one percent of participants scored below the conventional MMSE cutoff point (23/24) for significant CI, and a total of 89% had some degree of CI using Folstein classifications of mild to severe CI. Severity of impairment was as follows: 11 were intact (MMSE mean score, 28.6), 20 were classified as mildly impaired (MMSE mean score, 23.40), 27 were moderately impaired (MMSE mean score, 15.07) and 42 were severely impaired (MMSE mean score, 4.62). There was no statistically significant relationship between MMSE scores and DSS scores (r_s = −0.247, n = 42, P = >0.05).

Clinical diagnosis of dementia

One-third (32%) had a clinical diagnosis of dementia, and about one-third had a prior MMSE. Table 1 shows the cognitive status (MMSE) of residents with and without a clinical diagnosis. Virtually, all those with a clinical diagnosis (93.8%) were assessed as having a moderate or severe CI. One-third (32.4%) of those with no clinical diagnosis had a severe CI (MMSE ≤ 10), and a further 17.6% were moderately cognitively impaired (MMSE 20–11). More than three quarters (76.5%) of those without a clinical diagnosis had no prior MMSE.

DONs' perceptions of CI

DONs reported a CI prevalence rate of 77%. Severity of CI as assessed by DONs was, 23% were intact, 22% were mildly impaired, 21% were moderately impaired and 34% were severely impaired. Table 2 shows differences between DONs subjective perceptions of residents' cognitive status (Likert scale) and MMSE assessment (Kappa = 0.33). In each NH, DONs underestimated the severity of CI. A total of 65% of residents that DONs deemed cognitively intact were assessed by the MMSE as having a CI. A further 59% classified as mildly impaired were assessed by the MMSE as moderate or severe, and a further 38% of those classified as moderately impaired were considered severely impaired using the MMSE. Further analysis revealed how DSS scores were associated with DONs classification of residents cognitive status (U = 108, n = 42, P = <0.05).

Discussion

Our findings (MMSE) show that 89% of participants surveyed were cognitively impaired, of whom 42% were severely and 27% moderately impaired. These prevalence rates are higher than those reported elsewhere [2–8]. Whilst moderate to severe CI is not synonymous with dementia, and the MMSE can never be used as a diagnostic tool, these findings would suggest that within the NHs surveyed, there may have been a high degree of undetected dementia.

Our findings also show some discrepancy between DONs assessment of residents' cognitive status and MMSE results. Data show that whilst DONs by and large competently identified people with a severe CI (85%), they had more difficulty accurately identifying other degrees of CI. In particular, they were very likely to underestimate the level of CI experienced by residents with no prior clinical diagnosis. Of course recognising CI does not necessarily translate into improved quality of care, and regular updated MMSE scores do not rule out the adverse effects of AP in cases of DLB, however, our findings suggest that a clinical diagnosis of dementia helped DONs to have a more accurate perception of residents' cognitive status and that those without a diagnosis were more likely to be mis-identified.

This study has some limitations. Firstly, the sample is small and was drawn from only four Dublin-based NHs. Secondly, the study relied solely on cognitive and memory scales as screening tools, and functional capacity was not assessed. Thirdly, whilst the MMSE was best suited to the aims and objectives of the study, it is not a good instrument when residents are depressed, delirious, have other chronic or acute diseases such as Parkinson's disease or pneumonia or have significant communication problems including aphasia.

Conclusion

Results from this study show how a large majority of the residents surveyed in this research had a CI of whom a number were likely to have undiagnosed dementia. More attention needs to be paid in long-term care to the careful recognition, diagnosis and follow-up of CI and dementia.

Key points

- A very large number of participants in the surveyed NHs had a CI and in almost half of the cases, this impairment was severe.
- Very few participants had a clinical diagnosis of dementia.
- DONs in the surveyed NHs tended to underestimate the severity of the CI of the participants.
- More attention should be paid to the recognition, diagnosis and follow-up of the cognitive status of residents in long-term care.

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Conflicts of interest

The authors declare no conflicts of interest. This manuscript has been read and approved by all the authors.

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Supplementary data

Supplementary data mentioned in the text is available to subscribers at the journal website http://ageing.oxforjournal.org

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