Supplementary material

Kijowska V, Barańska I, Stodolska A, Szczerbińska K. Nonpharmacological interventions in patients with cognitive impairment: a comparison of residential and nursing homes in Poland. Pol Arch Intern Med. 2021; 131: 42-53. doi:10.20452/pamw.15731

SUPPLEMENTARY MATERIAL

The study was performed in the LTCFs in Poland: these included both NHs (refers to *pol. ZOL/ZPO, Zakład Opiekuńczo-Leczniczy or Zakład Pielęgnacyjno-Opiekuńczy*) and RHs (refers to *pol. DPS, Dom Pomocy Społecznej*) for older or chronically ill adults. Although terminology and typology varies between countries, a LTCF, generally refers to a collective institutional setting where care is provided to frail older people, who live there, 24h a day, seven days a week[1],[2]. In Poland, residents with CI are usually admitted to NHs (refers to *pol. ZOL/ZPO, Zakład Opiekuńczo-Leczniczy or Zakład Pielęgnacyjno-Opiekuńczy*) and RHs (refers to *pol. DPS, Dom Pomocy Społecznej*) are for older or chronically ill adults, and less specialist wards for patients with dementia, which are hardly available. NHs in Poland are facilities with the most skilled staff including nurses[3] where the aim is to avoid inappropriate admission to hospital or to facilitate early discharge from hospital; they provide 24-hour/7 days a week from a range of on-site healthcare professionals: medical doctors (with different specialties), nurses (specialists in long-term care nursing), physiotherapists, occupational therapists, social workers and psychologists. RHs are facilities primarily intended for those

[1] Reitinger E, Froggatt K, Brazil K, et al. Palliative Care in Long-term Care Settings for Older People: findings from an EAPC Taskforce. Eur J Palliat Care 2013; 20: 251–253.
[2] Sanford AM, Orrell M, Tolson D, et al. An International Definition for "Nursing Home". J Am Med Dir Assoc 2015; 16: 181–184.
[3] Sanford AM, Orrell M, Tolson D, et al. An International Definition for "Nursing Home". J Am Med Dir Assoc 2015; 16: 181–184.

who require assistance with ADLs or who have mild behavioral problems due to dementia or other diseases. RHs assure 24hr personal care by on-site employed care assistants; in addition there are physiotherapists, occupational therapists, social workers, and psychologists, but at lower employment rates than NHs.

The sampling procedure met minimum requirements regarding the expected number of both facilities and the residents. First, we performed a random sampling of 100 LTCFs out of 985; we identified four variables: six macro regions; two types of settings (NHs and RHs); small and big size of facility according to median number of beds; public and private ownership status). Invitations to participate in the study were sent to 100 LTCFs with 49 facilities returning a completed questionnaire concerning the facility's characteristics. Out of these 49 LTCFs, 23 facilities agreed to participate in the study and 26 declined to particpate. We conducted a non-response analysis by comparing LTCF organization characteristics of facilities involved in the study with those which declined. This analysis did not reveal significant differences in terms of their ownership status, number of beds, length of stay in the institution, level of dependency of residents measured with the use of Barthel Index and the number of patients requiring full assistance in eating, ratio of staffing level, access to physicians, number of wards for residents with dementia and specialized equipment for residents. Based on these results we assume that our study sample was representative for the country and the size of the sample was enough to perform statistically significant analyses.

Based on GUS (Central Statistics Office) data, most NHs were considered small settings (with average 52 beds per facility) with a non-public (private) ownership status (50%), whilst the majority of RHs were bigger (with average 68 beds per facility) and public non-profit facilities (70%)[4],[5]. In our study 36.4% of NH and 91.7% of RH were public non-profit. A mean (SD) number of beds in NH was 57.0 (20.5), ranging from 36 to 95 beds;

[4] [Health and health care in 2015]. Central Statistical Office of Warsaw. 2017, pp. 104–106. [*Polish]*

[5] [Social assistance, child and family services in 2015]. Central Statistical Office of Warsaw. 2016, pp. 192–194. *[Polish]*

while in RH it was 82.4 (33.8), ranging from 37 to 143. Availability of physiotherapists, psychologists, physicians and nurses was significantly better for residents in NH than in RH (see Supplementary *TABLE S1*).

Supplementary Table S1. Characteristics of 23 long-term care facilities – a comparison between nursing homes and residential homes

LTCF characteristics		**Total**	**Nursing homes (NHs)**	**Residential homes (RHs)**	***P* value**
Number of facilities, *n*		***23***	**11**	**12**	-
Status of provider, *n(%)*					
	Public non-profit	*15 (65.2)*	4 (36.4)	11 (91.7)	0.009[a]
	Private non-profit	*8 (34.8)*	7 (63.6)	1 (8.3)	
Number of beds, *mean (SD), [range]*		*70.3 (30.5) [36-143]*	57.0 (20.5) [36-95]	82.4 (33.8) [37-143]	0.05[b]
Number of hours the physicians are available in the institution (in a week), *Me (Q1-Q3)*		*9 (5-44)*	47 (30-78)	5 (3-7)	<0.001[b]
Internal ward for residents with dementia, *yes, n(%)*		*2 (8.7)*	-	2 (16.7)	0.47[a]
Staffing level, *n(%)*					
Physiotherapists	*Up to 0.03*	*13 (56.5)*	2 (18.2)	11 (91.7)	0.001[a]
	Above 0.03	*10 (43.5)*	9 (81.8)	1 (8.3)	
Psychologists	*Up to 0.01*	*10 (43.5)*	1 (9.1)	9 (75.0)	0.003[a]
	Above 0.01	*13 (56.5)*	10 (90.9)	3 (25.0)	
Occupational therapists	*Up to 0.02*	*10 (43.5)*	3 (27.3)	7 (58.3)	0.21[a]
	Above 0.02	*13 (56.5)*	8 (72.7)	5 (41.7)	
Treating doctors	*Up to 0.03*	*11 (47.8)*	2 (18.2)	9 (75.0)	0.006[a]
	Above 0.03	*12 (52.2)*	9 (81.8)	3 (25.0)	
All nurses	*Up to 0.10*	*12 (54.5)*	1 (10.0)	11 (91.7)	<0.001[a]
	Above 0.10	*10 (45.5)*	9 (90.0)	1 (8.3)	

[a]*P* value for Chi-squered or Fisher's exact test; [b]*P* value for U Mann-Whitney test

Note: above data was already published in the paper Kijowska et al. Eur Geriatr Med 2018;9:467–76 (apart staffing level).Staffing level for physiotherapists, psychologists, occupational therapists, treating doctors and nurses are based on the median value. P value refers to differences between NHs and RHs.

Supplementary Table S2 Characteristics of long-term care residents with cognitive impairment – a comparison between nursing homes and residential homes and between different levels of cognitive impairment in a random sample of 455 residents from 23 long-term care facilities in Poland

Resident's characteristics	*Total* *n = 455*	Facility type			Level of cognitive impairment			
		Nursing homes (NHs) n = 214	**Residential homes (RHs)** n = 241	*P* value	**Mild CI CPS = 2** n = 164	**Moderate CI CPS = 3-4** n = 100	**Severe CI CPS = 5-6** n = 191	*P* value
Gender, *male, n(%)*	*136 (29.1)*	58 (27.1)	78 (32.4)	0.22[c]	64 (39.0)	32 (32.0)	40 (20.9)	0.001[c]
Age at time of the data collection, *mean (SD)*	*78.3(12.1)*	79.7 (10.9)	77.0 (12.9)	0.017[d]	76.8 (11.9)	78.3 (11.7)	79.5 (12.4)	0.042[d,e]
female	*80.9 (11.1)*	81.6 (9.9)	80.3 (12.2)	0.70[d]	79.4 (11.2)	82.3 (9.2)	81.4 (11.8)	0.18[d]
male	*72.0 (12.0)*	74.6 (12.2)	70.1 (11.7)	0.020[d]	72.8 (12.1)	69.9 (11.9)	72.6 (12.3)	0.66[d]
Length of stay, *n(%)*								
up 6 months	*49 (10.8)*	36 (16.8)	13 (5.4)	<0.001[c]	16 (9.8)	15 (15.0)	18 (9.4)	0.52[c]
from 6 to 12 months	*86 (18.9)*	56 (26.2)	30 (12.4)		33 (20.1)	20 (20.0)	33 (17.3)	
above 12 months	*320 (70.3)*	122 (57.0)	198 (82.2)		115 (70.1)	65 (65.0)	140 (73.3)	
ADL dependency – ADLh[a], *n(%)*								
no	*52 (11.5)*	8 (3.8)	44 (18.3)	<0.001[c]	42 (25.6)	7 (7.0)	3 (1.6)	<0.001[c]
moderate	*125 (27.5)*	35 (16.4)	90 (37.3)		62 (37.8)	38 (38.0)	25 (13.1)	
severe	*277 (61.0)*	170 (79.8)	107 (44.4)		60 (36.6)	55 (55.0)	162 (85.3)	
Cognitive impairment – CPS[b], *n(%)*								
mild	*164 (36.0)*	56 (26.2)	108 (44.8)	<0.001[c]				
moderate	*100 (22.0)*	46 (21.5)	54 (22.4)					
severe	*191 (42.0)*	112 (52.3)	79 (32.8)					

Missing values: ADL dependency – ADLh: 1, Length of stay: 1.

[a]Based on Activities of Daily Living (ADL) self-performance hierarchy scale: no or minimal (0-1), moderate (2-3), and severe (4-6) ADL limitations.

[b]Based on Cognitive Performance Scale (CPS): mild (2), moderate (3-4), and severe (5-6) cognitive impairment.

[c]*P* value for Chi-squered or Fisher's exact test; [d]*P* value for U Mann-Whitney or Kruskal-Wallis test

[e]Multiple comparison for Kruskal-Wallis test with adjustment using Bonferroni correction: mild CI vs moderate CI, $P = 0.828$, mild CI vs severe CI, $P = 0.036$; moderate CI vs severe CI, $P = 0.881$.

Note: Part of the above data was already published in the paper Kijowska et al. Eur Geriatr Med 2020; 11: 255–267.