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ORIGINAL ARTICLE

Education needs in palliative care and advance care planning of Italian residents in neurology: an online survey

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Abstract

Background and purpose: Most neurological diseases have a chronic and progressive clinical course, with patients living for extended periods with complex healthcare needs. Evidence from other countries suggests that palliative care (PC) is insufficiently integrated in the care of these patients. This study aims to identify PC and advance care planning (ACP) knowledge and the perceived preparedness of Italian residents in neurology.

Methods: This is a cross-sectional online survey of physicians attending the 36 Italian neurology residency programmes.

Results: Of 854 residents, 188 (22%) participated. Their mean age was 28.4 ± 2.0 years; 49% were women; 45% were from the north, 23% from the centre and 32% from the south of Italy. Few residents (6%) reported that a teaching course in PC was part of the graduate programme, and 3% of the postgraduate programme. During their residency, 9% of participants received PC training, and 18% ACP training. Only 13% reported to have participated in the ACP process, half within their neurology residency programme. Residents considered PC support very/extremely important in all the pre-specified clinical situations, with values ranging between 78% and 96%. Over 70% of residents revealed education needs, particularly concerning ACP.

Conclusions: Our data confirm the need for improving PC training in the graduate and postgraduate curriculum. This, together with collaboration and joint training of neurology and PC, is essential to improve the quality and continuity of care and respond to the complex needs of people with neurological disorders causing severe disability.

KEYWORDS
advance care planning, Italian residents, palliative care, survey, training, young neurologists

INTRODUCTION

Most of the neurological diseases are characterized by a chronic and progressive clinical course. For some of these diseases, such as gliomas, amyotrophic lateral sclerosis and some dementias, the clinical trajectory is a few years. For others like Parkinson disease, chronic stroke, multiple sclerosis (MS) and neuromuscular diseases, patients can live for decades with complex healthcare needs.

Alessandro Bombaci and Francesco Di Lorenzo are co-first authors and contributed equally to this paper.

Palliative care (PC) is a specialty of medicine intended to improve the quality of life of patients bearing an unfavourable prognosis, by addressing their physical, psychosocial and existential needs with the ultimate goal of providing relief and support to patients and their families in periods of crisis along the disease trajectory, including the end-of-life period [1, 2]. It is expected that, by 2060, the burden of serious health-related suffering will almost double, the greatest increase being for dementias [3]. However, there is a shortage of specialist PC healthcare professionals [2]. An integration of neurology and PC has been advocated [4–6]. Moreover, PC can be delivered by healthcare professionals with good basic PC skills and knowledge who have not specialized in this discipline (general PC) [6], and it has been proposed that PC training should involve neurologist information, as strongly affirmed also by the American Council for Graduate Medical Education (ACGME) [7, 8]. The American Academy of Neurology advocates for the role of neurologists in providing PC, recognizing that many neurological illnesses are progressive and incurable; the relief of suffering is amongst the most important benefits that physicians can provide to these patients; and the optimal care of such patients requires that neurologists understand and apply the principles of palliative medicine [9]. Since the 1990s the American Academy of Neurology have documented the gap between medical, legal and ethical guidelines for the care of dying patients and the beliefs and practices of many neurologists, suggesting a need for graduate and postgraduate education programmes in the principles and practices of PC [9, 10].

A national online survey amongst consultants in neurology and residents in the Netherlands showed that discussions on treatment restrictions are initiated close to the end-of-life phase in patients with high grade gliomas, Parkinson disease or MS [11]. Over half of the 125 respondents reported a need for improvement of their skills in performing these discussions. A recent survey of neurology residents in the United States [12] found a lack of training in PC and, particularly, 'the need for active learning, with observed practice, debriefing and feedback'. This survey is in line with a previous one of US programme directors which showed that at least 20% of adult neurology residency programmes did not offer PC education, in contrast to ACGME guidelines [13].

In Italy access to PC in patients with non-oncological disorders has been regulated for over 10 years (Law 38/2010). As per this law, there are two levels of PC delivery: general PC, provided by health professionals, including neurologists, who do not have PC as the main aim of their activity; and specialist PC, provided by PC services whose focus is caring for people with complex care needs. Specialist PC services may include neurologists fully dedicated to PC. Moreover, the Italian Law 219/2017 'Provisions on informed consent and advance healthcare directives' introduces significant innovations concerning the safeguarding of patient's autonomy and informed consent, advance care planning (ACP) and the duty of the physician to inform about PC, and to avoid diagnostic or therapeutic obstinacy. ACP is defined as a process that 'enables individuals who have decisional capacity to identify their values, to reflect upon the meanings and consequences of serious illness scenarios, to define goals and preferences for future medical treatment and care, and to discuss these with family and healthcare providers' [14]. By determining an individual's values and preferences with regard to their medical care, ACP helps to align care with these identified values and preferences and is an essential element of quality PC. ACP is even more important in the context of neurodegenerative disorders where dementia and other impairments can lead to the loss of an individual's decision-making capacity [15].

Examining the organization of neurology residency programmes in Italy, an overarching decree governs the operation of all residency programmes, as detailed on the official website (https://www.gazzettaufficiale.it/eli/id/2015/06/03/15A04227/sg). Regrettably, this decree lacks specific provisions regarding education and training in PC and ACP. Consequently, since each local neurology school interprets and implements these regulations independently, the teaching of PC and ACP lacks uniformity and varies amongst neurology schools throughout Italy. Based on these observations, the aim of the present study was to assess the PC and ACP knowledge and perceived preparedness of Italian residents of neurology who participated in a web survey. The survey was a collaborative initiative of the Italian Society of Neurology (SIN) and the Italian Society of PC (SICP), through the SIN–SICP Intersociety Table established in 2021. The SIN Study Groups of 'Young Neurologists' and 'Bioethics and PC' were responsible for the survey setup, implementation and analysis.

MATERIALS AND METHODS

The postgraduate (residency) programme in neurology is active in 36 Italian universities and each programme has a young representative [16]. On 2 June 2022 the young representatives and the Directors of all the Italian Schools were contacted by email, inviting them to forward the email to physicians attending their neurology residency programme. The email included an invitation letter outlining the aims of the survey, its anonymity and the expected completion time; and a link to the web survey. The survey was advertised via WhatsApp channels of residents. It was developed using Google Forms, in accordance with the Checklist for Reporting Results of Internet E-Surveys (CHERRIES) [17] (Data S2).

FDL, SV and AS produced a draft version, which was revised by AB and EP. In an online meeting of the authors, proposed revisions were discussed and a final version was produced. FDL and AB checked the wording, format and response options of each item, as well as item order, ensuring that everything worked as intended.

The survey was anonymous to promote openness and trustworthiness and could be accessed only once from a given institutional email contact, in order to prevent multiple entries from the same user. Access with personal email was not allowed. No

personal information was collected and no ethical approval was pursued. Two reminders were sent by both young representatives and Directors after 15 and 30 days. The survey was closed after 6 weeks.

The survey consisted of a total of 25 items grouped into two sections (Data S1): eight items were on demographics and residency features (section A) and 17 items on PC knowledge and training (section B). Response options included yes/no, Likert scales, multiple-choice and free-text boxes. Completion time was around 15 min. Respondents could review and modify their responses before survey submission. No incentives were offered to residents for taking the time to fill out the survey.

Statistical analysis

Categorical variables were summarized as numbers and percentages; they were compared by χ^2 or Fisher's exact test. Continuous variables were summarized as means and SD or medians with interquartile ranges; they were compared by ANOVA, the Wilcoxon rank-sum test or Kruskal–Wallis test. All analyses were performed using STATA 16 (College Station, TX, USA).

RESULTS

Between June and July 2022, responses were received from 192/854 physicians (22%) attending all the 36 Italian neurology residency programmes (median participants per programme four, range 1–9). Three participants did not complete all items of section B and were excluded from the analysis. The mean age of residents was 28.4 years and 49% were women; 84 were from the north (45%), 43 from the centre (23%) and 61 from the south (32%) of Italy (Table 1).

In all, 109 participants (58%) were in their first or second year of residency and 79 (42%) were in their third or fourth year. Stroke was the most reported area of interest (29%), followed by MS (21%), movement disorders (20%) and dementia (19%). A total of 124 residents (66%) reported working mainly in outpatient and inpatient clinics, 21% in the emergency department and 13% in research.

Education and training in PC (items 9–17)

Few residents (11/185, 6%) reported that their Faculty of Medicine had a teaching course in PC (worth 1 or 2 credits), 88% reported it did not, and 6% did not know. Only 3% of residents reported that the neurology residency programme included education in PC, 82% reported that it did not, and 15% did not know. In addition, 7% of residents reported having attended an extracurricular PC course. Of note, 82% of residents reported they had not received any training on the Law 219/2017. Figures for the Law 38/2010 were even worse, with 168 residents (91%) reporting that they had not received any training.

Only 24 out of 185 residents (13%) reported to have participated in the ACP process, half within their residency programme and half outside of it.

Only 22 participants (12%) reported to have received some practical training on the Law 219/2017 within their working organization, organized by the personnel of the ward. Figures were similar considering the sub-group of 50 residents (27%) attending amyotrophic sclerosis, neuro-oncology, dementia or stroke clinics, five of whom reported to have received ACP training.

Focusing on the spread of training in PC and ACP in the neurological district where they work, 56% of residents reported that there have been no training courses and 32% did not know. Furthermore, 70% of residents reported that there was a PC service in the province where they work, 3% reported that there was none, whilst 27% did not know. Of 131 residents answering that a PC service was present, five (4%) reported that neurologists were part of the PC team, 29 (22%) reported that they were not, and 98 (75%) did not know.

PC knowledge and education needs (items 18–25)

Three items (18–20) assessed PC knowledge (Data S1). Item 18 asked to select the incorrect statement on PC features ('is only provided to patients nearing death') from a set of four statements. A total of 168 residents (89%) selected it properly. Item 19 asked to select the incorrect statement from a set of three on the purpose of continuous deep sedation (CDS). Most residents (176; 94%) correctly identified the wrong statement ('to hasten the death of incurable patients experiencing otherwise intolerable and refractory physical or psycho-existential suffering'). Finally, item 21 was about the recipients of ACP. Only 34 residents (18%) selected the correct statement 'only patients with chronic disabling diseases or a poor prognosis'. Eighty-three residents (44%) selected 'all adult citizens', 18 (10%) 'all hospitalized patients' and 53 (28%) did not know.

Over 70% of residents reported having unmet PC education needs (Figure 1; Table 1). Of these, 78% expressed the need for both theoretical and practical training. Finally, most residents considered PC support very/extremely important for all the pre-specified clinical situations, with values ranging between 78% for 'difficult communication' and 96% for 'management of complex symptoms' (Figure 1).

Findings did not differ by year of residency (data not shown) except for a higher percentage of correct answers on item 21 in year 3–4 residents (25.3%) compared to year 1–2 residents (12.8%; $p=0.03$). Concerning geographical areas, a PC teaching course was reported during residency by five participants only, all from the north of Italy (Table 1). Lower participation in CDS ($p<0.001$) and ACP procedure ($p=0.04$) was reported within the residency programme in the south. Finally, availability of a PC unit/service in the working area/province was significantly lower in the south ($p=0.001$) (Table 1).

TABLE 1 Participant characteristics and responses regarding the spread of palliative care (PC), their PC knowledge and education needs across the three geographical areas of Italy.

	North (*N* = 84)	Centre (*N* = 43)	South (*N* = 61)	Total (*N* = 188)	*p* value
Characteristics	*N* (%)				
Women	40 (47.6)	23 (53.5)	29 (47.5)	92 (48.9)	0.79
Age (years)[a]	28.2 (2.0)	28.7 (2.3)	28.5 (1.7)	28.4 (2.0)	0.39
Year of residency					
1–2	51 (60.7)	27 (62.8)	31 (50.8)	109 (58.0)	0.38
3–4	33 (39.3)	16 (37.2)	30 (49.2)	79 (42.0)	
Main activity[b]					
Outpatient setting	69 (82.1)	39 (90.7)	55 (90.2)	163 (86.7)	0.25
Inpatient setting	70 (83.3)	30 (69.8)	45 (73.8)	145 (77.1)	0.17
Research	17 (20.2)	14 (32.6)	16 (26.2)	47 (25.0)	0.30
Emergency setting	23 (27.4)	8 (18.6)	7 (11.5)	38 (20.2)	0.06
Main area of interest[b]					
Cerebrovascular	27 (32.1)	10 (23.3)	17 (27.9)	54 (28.7)	0.57
MS/demyelinating	11 (13.1)	9 (20.9)	19 (31.2)	39 (20.7)	**0.03**
Movement disorders	13 (15.5)	5 (11.6)	12 (19.7)	30 (16.0)	0.54
Dementia	15 (17.9)	5 (11.6)	8 (13.1)	28 (14.9)	0.55
Headache	13 (15.5)	4 (9.3)	11 (18.0)	28 (14.9)	0.46
Epilepsy	15 (17.9)	5 (11.6)	6 (9.8)	26 (13.8)	0.34
Neuromuscular	10 (11.9)	0 (0.0)	8 (13.1)	18 (9.6)	**0.05**
MND	5 (6.0)	1 (2.3)	2 (3.3)	8 (4.3)	0.57
PC spread					
Teaching course at Faculty of Medicine	25 (29.8)	11 (25.6)	11 (18.0)	47 (25.0)	0.28
Teaching course at residency in neurology	5 (6.0)	0 (0.0)	0 (0.0)	5 (2.7)	**0.05**
Extracurricular education received	9 (10.7)	2 (4.7)	2 (3.3)	13 (6.9)	0.22
Education on the Law 38/2010 received	11 (13.1)	4 (9.3)	2 (3.3)	17 (9.0)	0.12
Education on the Law 219/2017 received	15 (17.9)	7 (16.3)	11 (18.0)	33 (17.6)	1.00
Participation in CDS procedure					
Within residency	16 (19.1)	5 (11.6)	1 (1.6)	22 (11.7)	**0.001**
Outside residency	56 (66.7)	35 (81.4)	58 (95.1)	149 (79.3)	
Participation in ACP process					
Within residency	7 (8.3)	5 (11.6)	2 (3.3)	14 (7.5)	**0.04**
Outside residency	70 (83.3)	35 (81.4)	59 (96.7)	164 (87.2)	
PC unit/service in the area/province	70 (83.3)	34 (79.1)	27 (44.3)	131 (69.7)	**<0.001**
PC knowledge and needs					
Knowledge (correct answer)					
PC feature	75 (89.3)	40 (93.0)	52 (85.3)	167 (88.8)	0.46
Purpose of CDS	76 (90.5)	42 (97.7)	58 (95.1)	176 (93.6)	0.24
ACP recipients	12 (14.3)	10 (23.3)	12 (19.7)	34 (18.1)	0.43
Education needs (0–10 scale)[c]					
Communication skills	8 (5–10)	8 (5–10)	7 (3–10)	8 (4.5–10)	0.18

TABLE 1 (Continued)

	North (*N* = 84)	Centre (*N* = 43)	South (*N* = 61)	Total (*N* = 188)	*p* value
Team working	8 (4–9)	8 (5–10)	7 (3–9)	8 (4–9)	0.41
Identification of patient needs	8 (6–10)	8 (5–10)	8 (7–10)	8 (3–10)	0.14
CDS	8 (6–10)	8 (5–8)	7 (4–8)	8 (5–9)	0.28
ACP	8 (6.5–10)	8 (7–10)	7 (4–9)	8 (6–10)	0.28
Management of EoL symptoms	8 (6.5–9.5)	8 (7–10)	8 (5–9)	8 (4–9)	0.50

Note: Bold values for $p \leq 0.05$.

Abbreviations: ACP, advance care planning; CDS, continuous deep sedation; EoL, end of life; MND, motor neuron disease; MS, multiple sclerosis.

[a]Mean (SD).

[b]Totals can exceed 188.

[c]Median (interquartile range).

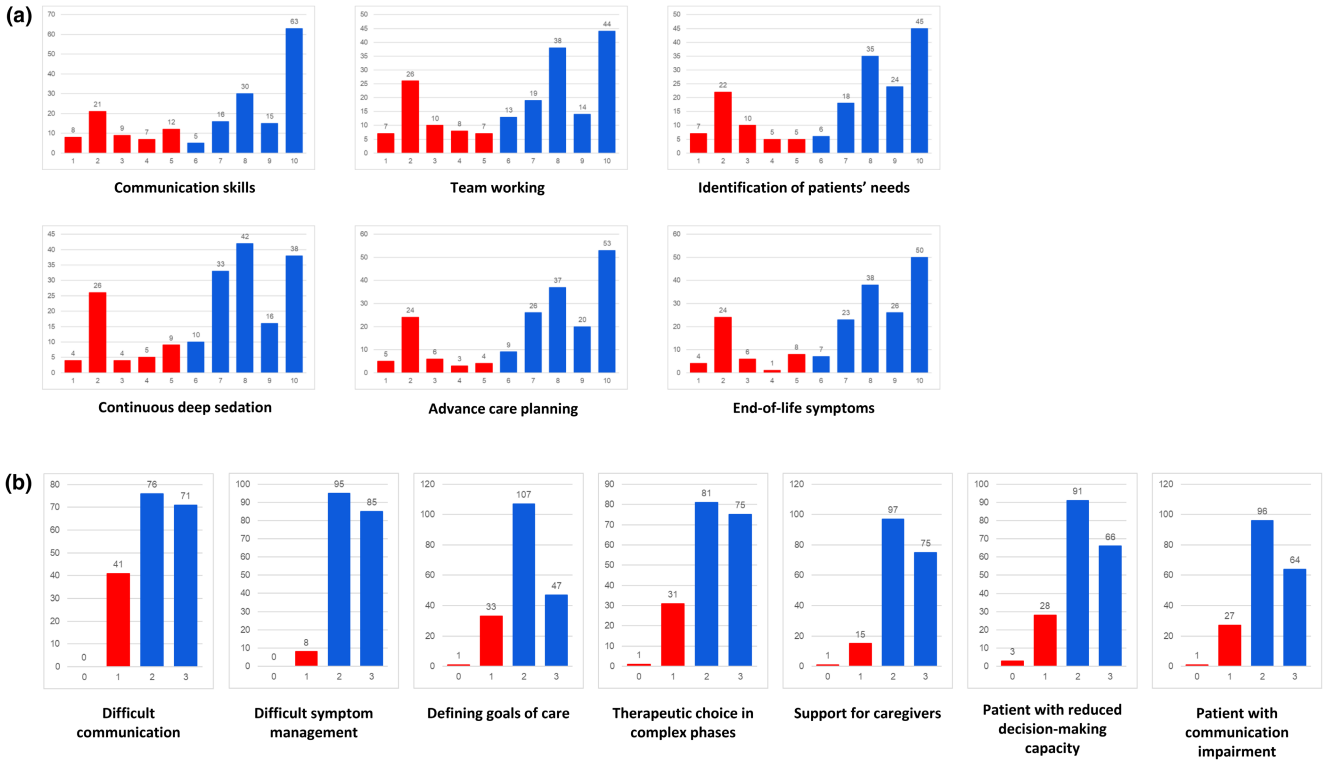

FIGURE 1 Training needs and importance of palliative care amongst Italian residents in neurology. (a) Participant's rating of their training needs, using a 0–10 numerical rating scale where 0 indicates no needs and 10 highest needs. (b) Rating of the importance of palliative care in a challenging situation, using a 4-point Likert scale where 0 indicates not at all important, 1 partially important, 2 very important, 3 most important.

DISCUSSION

The outcomes derived from our survey conducted amongst neurology residents reveal a discernible deficiency in PC education at both pre-graduate and postgraduate levels. These findings align with similar observations in international contexts [18, 19]. The identification and management of PC needs remains largely inadequate and often overlooked [8], and this deficiency appears notably pronounced amongst junior neurologists [12, 20]. Despite advancements in the prevention and management of certain disorders, particularly stroke, neurological disorders at present stand as the predominant cause of global disability. This burden is anticipated to almost double by 2050 [21]. Consequently, a considerable number of patients find themselves in advanced disease stages, marked by complete loss of autonomy and grim prognoses. These patients necessitate extensive care for the comprehensive assessment and treatment of their physical, psychosocial and spiritual/existential needs. Within this context, PC emerges as the preferred standard of care for this patient population, necessitating concerted efforts in educational programmes to address this critical facet. The mutual education proposed by the consensus review [6] on the development of PC for people living with chronic and progressive neurological disorders remains a concrete possible solution to this gap of knowledge. Neurologists should learn the principle of PC and be able to provide general PC; on the other

hand PC physicians working in specialist PC services must acquire competence on the identification and management of symptoms specific to neurological disorders. It is also worth mentioning neuropalliative care, an emerging field within neurology dedicated to improving the quality of care for patients and their families using a PC approach [22, 23].

In Italy, less than 6% of neurology residents reported receiving PC education during their Faculty of Medicine training, with approximately 3% acquiring such education during their residency. The lack of training in ACP and in CDS is more evident in the south of Italy; these data are in line with previous evidence [24]. Moreover, the demand for PC is notably acute amongst residents specializing in motor neuron disease, neuro-oncology, dementia or stroke clinics.

Despite the educational gaps, participants exhibit a profound awareness of the pivotal role of PC in neurology. Notably, at least two-thirds of residents expressed a substantial need for training in various aspects of PC, including communication with patients, teamwork, identification of patient needs, CDS, ACP, and management of end-of-life symptoms. Virtually all participants underscored the necessity for a blend of theoretical and practical training. These findings are substantiated by the European Academy of Neurology, which recognizes the acquisition of PC knowledge as a fundamental component of the European Training Requirements for Neurology [25]. US neurologists participating in a web survey reported that they had received little formal PC training [8]. This was found to be particularly challenging since patients with neurological disorders often have an uncertain prognosis and a combination of physical and cognitive impairments, resulting in complex care needs and suffering.

These findings point to an urgent need for the development of specific courses on PC across all Italian universities, both in undergraduate medical programmes and within neurology specialization pathways. In addition to this, it would be instrumental to champion educational initiatives such as master's programmes, summer schools and professional courses to empower neurologists in acquiring enhanced proficiency in PC. Lastly, the active engagement of neurologists within interdisciplinary and interprofessional networks, involving close collaboration with PC specialists, can serve as a formative influence, along with contributing to research endeavours.

Finally, with regard to methodology, our survey was disseminated digitally to neurology residents, following the approach adopted by Cook et al. [12] and Walter et al. [11]. One notable aspect of our study is the slightly higher response rate in comparison to similar endeavours (22% in our survey compared to 15% and 19%), as well as the ability to engage all residency programmes nationwide (not done in the other studies). This achievement may be attributed to the dual distribution channels employed for the survey, involving both personal email outreach and direct communication with programme directors.

A notable limitation of our survey lies in its response rate, which stands at 22%. It is possible that residents with a greater interest in the topic participated. Consequently, the data within the general population of residents in neurology could be even worse than those presented. Furthermore, it is noteworthy that, in comparison to extant surveys, our survey boasts a higher response rate.

In conclusion, our findings are in line with previous surveys conducted in Europe [11] and in the United States [10, 12, 13]. We believe that training in PC should be mandatory in Italian neurology programmes to provide residents with general skills and knowledge in this discipline, consistent with the early and simultaneous model of (neuro) PC [26, 27]. Specifically, it is key to enhancing neurologists' competences and self-confidence in initiating ACP conversations. Finally, further research is needed to identify barriers and facilitators of ACP uptake, and to assess the efficacy of interventions promoting this practice in neurology [15].

AUTHOR CONTRIBUTIONS

Alessandro Bombaci: Conceptualization; investigation; writing – original draft; methodology; formal analysis; software; visualization; data curation. **Francesco Di Lorenzo:** Conceptualization; investigation; writing – original draft; visualization. **Eugenio Pucci:** Writing – review and editing; validation; supervision; conceptualization; methodology. **Alessandra Solari:** Supervision; writing – review and editing; visualization; validation; conceptualization; formal analysis; data curation. **Simone Veronese:** Validation; writing – review and editing; supervision; conceptualization.

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None.

CONFLICT OF INTEREST STATEMENT

None of the authors have anything to disclose.

DATA AVAILABILITY STATEMENT

The data that support the findings of this study are openly available in ZENODO at https://zenodo.org/, reference number 10.5281/ZENODO.10629981.

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REFERENCES

1. Teoli D, Schoo C, Kalish VB. Palliative care. *StatPearls [Internet]*. StatPearls Publishing; 2023.
2. Provinciali L, Carlini G, Tarquini D, Defanti CA, Veronese S, Pucci E. Need for palliative care for neurological diseases. *Neurol Sci*. 2016;37(10):1581-1587. doi:10.1007/S10072-016-2614-X
3. Sleeman KE, de Brito M, Etkind S, et al. The escalating global burden of serious health-related suffering: projections to 2060 by world regions, age groups, and health conditions. *Lancet Glob Health*. 2019;7(7):e883-e892. doi:10.1016/S2214-109X(19)30172-X
4. Liu Y, Kline D, Aerts S, et al. Inpatient palliative care for neurological disorders: lessons from a large retrospective series. *J Palliat Med*. 2017;20(1):59-64. doi:10.1089/JPM.2016.0240
5. Boersma I, Miyasaki J, Kutner J, Kluger B. Palliative care and neurology: time for a paradigm shift. *Neurology*. 2014;83(6):561-567. doi:10.1212/WNL.0000000000000674
6. Oliver DJ, Borasio GD, Caraceni A, et al. A consensus review on the development of palliative care for patients with chronic and progressive neurological disease. *Eur J Neurol*. 2016;23(1):30-38. doi:10.1111/ENE.12889
7. ACGME. ACGME Program Requirements for Graduate Medical Education in Neurology. Accessed February 3, 2024. www.acgme.org/OsteopathicRecognition
8. Creutzfeldt CJ, Robinson MT, Holloway RG. Neurologists as primary palliative care providers: communication and practice approaches. *Neurol Clin Pract*. 2016;6(1):40-48. doi:10.1212/CPJ.0000000000000213
9. Palliative care in neurology. The American Academy of Neurology Ethics and Humanities Subcommittee. *Neurology*. 1996;46(3):870-872.
10. Carver AC, Vickrey BG, Bernat JL, Keran C, Ringel SP, Foley KM. End-of-life care: a survey of US neurologists' attitudes, behavior, and knowledge. *Neurology*. 1999;53(2):284-293. doi:10.1212/WNL.53.2.284
11. Walter HAW, Seeber AA, Willems DL, De Visser M. The role of palliative care in chronic progressive neurological diseases—a survey amongst neurologists in the Netherlands. *Front Neurol*. 2019;9:1157. doi:10.3389/FNEUR.2018.01157
12. Cook T, Arnold R, Jeong K, Childers J. Opinion and special article: next steps in palliative care education for neurology residents. *Neurology*. 2021;97:1134. doi:10.1212/WNL.0000000000012911
13. Mehta AK, Najjar S, May N, Shah B, Blackhall L. A needs assessment of palliative care education among the United States adult neurology residency programs. *J Palliat Med*. 2018;21(10):1448-1457. doi:10.1089/JPM.2018.0191
14. Rietjens JAC, Sudore RL, Connolly M, et al. Definition and recommendations for advance care planning: an international consensus supported by the European Association for Palliative Care. *Lancet Oncol*. 2017;18(9):e543-e551. doi:10.1016/S1470-2045(17)30582-X
15. Giordano A, De Panfilis L, Perin M, et al. Advance care planning in neurodegenerative disorders: a scoping review. *Int J Environ Res Public Health*. 2022;19(2):803. doi:10.3390/IJERPH19020803
16. Di Lorenzo F, Ercoli T, Cuffaro L, et al. COVID-19 impact on neurology training program in Italy. *Neurol Sci*. 2021;42(3):817-823. doi:10.1007/s10072-020-04991-5
17. Eysenbach G. Improving the quality of web surveys: the Checklist for Reporting Results of Internet E-Surveys (CHERRIES). *J Med Internet Res*. 2004;6(3):e34. doi:10.2196/JMIR.6.3.E34
18. Fields L, Shalev D, Nathanson M, Shapiro PA. Palliative care training for geriatric psychiatry fellows: a national survey project. *Am J Geriatr Psychiatry*. 2022;30(4):504-510. doi:10.1016/J.JAGP.2021.08.008
19. Paal P, Brandstötter C, Lorenzl S, Larkin P, Elsner F. Postgraduate palliative care education for all healthcare providers in Europe: results from an EAPC survey. *Palliat Support Care*. 2019;17(5):495-506. doi:10.1017/S1478951518000986
20. Oliver D, Borasio GD, Veronese S, Voltz R, Lorenzl S, Hepgul N. Current collaboration between palliative care and neurology: a survey of clinicians in Europe. *BMJ Support Palliat Care*. 2020;14:e743-e748. doi:10.1136/BMJSPCARE-2020-002322
21. Feigin VL, Owolabi MO, World Stroke Organization–Lancet Neurology Commission Stroke Collaboration Group. Pragmatic solutions to reduce the global burden of stroke: a World Stroke Organization-Lancet Neurology Commission. *Lancet Neurol*. 2023;22(12):1160-1206. doi:10.1016/S1474-4422(23)00277-6
22. Brizzi K, Creutzfeldt CJ. Neuropalliative care: a practical guide for the neurologist. *Semin Neurol*. 2018;38(5):569-575. doi:10.1055/S-0038-1668074
23. Taylor LP, Besbris JM, Graf WD, Rubin MA, Cruz-Flores S, Epstein LG. Clinical guidance in neuropalliative care: an AAN position statement. *Neurology*. 2022;98(10):409-416. doi:10.1212/WNL.0000000000200063
24. Rapporto al Parlamento sullo stato di attuazione della Legge n. 38 del 15 marzo. Disposizioni per garantire l'accesso alle cure palliative e alla terapia del dolore. 2010. Accessed April 7, 2024. https://www.salute.gov.it/portale/documentazione/p6_2_2_1.jsp?id=2814
25. Bassetti CLA, Soffietti R, Vodušek DB, et al. The 2022 European postgraduate (residency) programme in neurology in a historical and international perspective. *Eur J Neurol*. 2023;31:e15909. doi:10.1111/ENE.15909
26. Oliver D. Improving patient outcomes through palliative care integration in other specialised health services: what we have learned so far and how can we improve? *Ann Palliat Med*. 2018;7(Suppl 3):S219-S230. doi:10.21037/APM.2018.05.05
27. Payne S, Harding A, Williams T, Ling J, Ostgathe C. Revised recommendations on standards and norms for palliative care in Europe from the European Association for Palliative Care (EAPC): a Delphi study. *Palliat Med*. 2022;36(4):680-697. doi:10.1177/02692163221074547

SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.

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