Research Article / Araştırma Makalesi

Reasons for Neurology Consultation in Palliative Care Patients *

Ümit Görgülü [1♦], Fatma Seda Bingöl [2], Hesna Bektaş [3], Kadriye Kahveci [4]

[1] Asst. Prof., University of Health Sciences, Ankara, Türkiye / drumitgorgulu@hotmail.com.

[2] Assistant Doctor, Ankara City Hospital, Ankara, Türkiye / fatmasedabingl@gmail.com.

[3] Prof., Ankara Yıldırım Beyazıt University, Ankara, Türkiye / hesnabek-1@hotmail.com.

[4] Prof., University of Health Sciences, Ankara, Türkiye / kahvecikadriye@gmail.com.

Abstract: Neurological diseases are the second most common group of diseases requiring palliative care (PC) after cancer, and neurological evaluations may be required frequently in PC patients. In this study, we aimed to investigate the reasons for neurology consultation of patients followed in a PC center (PCC). The medical records of patients assessmented with neurological consultation at our hospital PCC between 2020 and 2022 were retrospectively reviewed. Our study included 223 patients with a mean age of 78 (18-98) years; 54.3% were female, with a mean GCS score of 10 (4-14). At least one neurological diagnosis was present in 65.5% of the patients. The most common neurological diseases were dementia (30.9%), stroke (27.4%), Parkinson's disease (12.6%) and epilepsy (10.8%). Reasons for neurological consultations included re-treatment planning related to neurological diseases (34.5%; most commonly for stroke 19.3%), swallowing assessment (29.1%), healthcare documentation needs (20.6%; medications, guardianship, bed, care, and disability) and seizures (5.4%). In conclusion, neurological diseases are frequently observed in PC patients, often necessitating neurological assessments for disease re-treatment planning, nutritional support, and care requirements during the care process.

Keywords: Palliative Care, Neurological Assessment, Neurological Diseases, Neurology Consultation.

JEL Classification: I1, I10, I19

Received Date: 15.08.2023

Accepted Date: 24.09.2023

How to Cite this Article: Görgülü, Ü., Bingöl, F. S., Bektaş, H., & Kahveci, K. (2023). Reasons for Neurology Consultation in Palliative Care Patients. *Bilecik Şeyh Edebali Üniversitesi Sağlık Bilimleri Fakültesi Dergisi,* 1(2), 111-118.

Palyatif Bakım Hastalarında Nöroloji Konsültasyon Nedenleri

Ümit Görgülü [1♦], Fatma Seda Bingöl [2], Hesna Bektaş [3], Kadriye Kahveci [4]

[1] Dr. Öğr. Üyesi, Sağlık Bilimleri Üniversitesi, Ankara, Türkiye / drumitgorgulu@hotmail.com.

[2] Asistan Doktor, Ankara Şehir Hastanesi, Ankara, Türkiye / fatmasedabingl@gmail.com.

[3] Prof. Dr., Ankara Yıldırım Beyazıt Üniversitesi, Ankara, Türkiye / hesnabek-1@hotmail.com.

[4] Prof. Dr., Sağlık Bilimleri Üniversitesi, Ankara, Türkiye / kahvecikadriye@gmail.com.

Özet: Nörolojik hastalıklar, kanserden sonra palyatif bakımın (PB) gerektiren en yaygın hastalık grubudur ve PB hastalarında sıkça nörolojik değerlendirme gerekebilir. Bu çalışmada, PB merkezinde (PBM) takip edilen hastaların nöroloji konsültasyon nedenlerini araştırmayı amaçladık. 2020 ile 2022 yılları arasında hastanemiz PBM'nde nöroloji konsültasyonu ile değerlendirilen hastaların tıbbi kayıtları retrospektif olarak incelendi. Çalışmamız ortalama yaşın 78 (18-98) yıl olduğu 223 hastayı içeriyordu; %54.3'ü kadındı ve ortalama GKS skoru 10 (4-14)'du. Hastaların %65.5'inde en az bir nörolojik hastalık tanısı bulunmaktaydı. En yaygın nörolojik hastalıklar sırasıyla demans (%30.9), inme (%27.4), Parkinson hastalığı (%12.6) ve epilepsiydi (%10.8). Nöroloji konsültasyon nedenleri arasında nörolojik hastalıklara yönelik yeniden tedavi planlaması (%34.5; en sık inme için [19.3%]), yutma değerlendirmesi (%29.1), sağlık belgesi ihtiyaçları (%20.6; ilaçlar, vesayet, yatak, bakım ve engellilik) ve nöbet (%5.4) yer almaktaydı. Sonuç olarak nörolojik hastalıklar, PB hastalarında sıkça görülmekte olup, bakım sürecinde sıklıkla yeniden tedavi planlaması, beslenme desteği ve bakım gereksinimleri için nörolojik değerlendirme gerektirebilmektedir.

Anahtar Kelimeler: Palyatif Bakım, Nörolojik Değerlendirme, Nörolojik Hastalıklar, Nöroloji Konsültasyonu.

JEL Sınıflandırması: I1, I10, I19

Başvuru Tarihi: 15.08.2023

Kabul Tarihi: 24.09.2023

Bu Makaleye Atıf İçin: Görgülü, Ü., Bingöl, F. S., Bektaş, H., & Kahveci, K. (2023). Reasons for Neurology Consultation in Palliative Care Patients. *Bilecik Şeyh Edebali Üniversitesi Sağlık Bilimleri Fakültesi Dergisi,* 1(2), 111-118.

♦ ***Corresponding Author / Sorumlu Yazar***

* *This study was presented as an abstract at the Uludağ Neurology Days held from March 3 to 6, 2022.*

** *This study has been found to be ethically appropriate by the Ethics Committee for Clinical Research of Ankara City Hospital, with decision number E1-22-2688 dated 15th June 2022.*

GENİŞLETİLMİŞ ÖZET

Araştırma Problemi

Nörolojik hastalıklar, kanserden sonra PB gerektiren en yaygın hastalık grubudur ve PB hastalarında sıkça nörolojik değerlendirme gerekebilir. Çalışmanın amacı PBM'nde takip edilen hastaların nöroloji konsültasyon nedenlerini, eşlik eden nörolojik hastalıklarını ve demografik özelliklerini araştırmaktır.

Araştırma Soruları

PB hastalarının nöroloji konsültasyonu ile değerlendirilme nedenleri nelerdir? PB hastalarında en sık görülen nörolojik hastalık tanıları nelerdir? PBM'nde nöroloji konsültasyonu istenen hastalarda yaş, cinsiyet gibi demografik veri özellikleri nasıldır?

Literatür Taraması

Bu çalışmada PUBMED, COCHRANE Library (The Cochrane Collaboration), Türkiye Bilimsel ve Teknik Araştırma Kurumu (TÜBİTAK) ULAKBIM (Ulusal Akademik Ağ ve Bilgi Merkezi) ve MEDLINE (Tıp Literatür Analizi ve Erişim Sistemi) veri tabanları taranmıştır. Konuyu taramak için palyatif bakım, nörolojik değerlendirme, nöroloji konsültasyonu, nörolojik hastalıklar ve nörolojik semptomlar anahtar kelimeleri kullanıldı.

Metodoloji

2020-2022 yılları arasında hastanemiz PBM'nde takip edilen ve nöroloji konsültasyonu ile değerlendirme istenen hastaların tıbbi kayıtları retrospektif olarak tarandı. Hastaların yaşı, cinsiyeti, eşlik eden hastalıkları, GKS skorları, nöroloji konsültasyon nedenleri ve eşlik eden nörolojik hastalıkları (inme, multipl skleroz, demans, Parkinson hastalığı, kore, ALS, epilepsi, serebral palsi, Guillain-Barre sendromu, ensefalit, trigeminal nevralji ve diğer nörolojik bozukluklar) kaydedildi.

Bulgular ve Sonuç

Çalışmamız ortalama yaşın 78 (18-98) yıl olduğu 223 hastayı içeriyordu; %54.3'ü kadındı ve ortalama GKS skoru 10 (4-14)'du. Hastaların %65.5'inde en az bir nörolojik hastalık tanısı mevcuttu. En sık görülen nörolojik hastalıklar demans (%30.9), inme (%27.4), Parkinson hastalığı (%12.6) ve epilepsiydi (%10.8). Nöroloji konsültasyon nedenleri arasında yeniden tedavi planlaması (%34.5; en sık inme %19.3), yutma değerlendirmesi (%29.1), sağlıkla ilgili dokümantasyon ihtiyaçları (%20.6; ilaç, vesayet, yatak, bakım ve engellilik) ve nöbet (%5.4) yer almaktaydı. Hastalar yaş ve cinsiyete göre sınıflandırıldığında da, kadın, erkek veya 80 yaş altı hastalarda nörolojiye başvurmanın en sık nedeni, özellikle inme olmak üzere bir tedavi planının değerlendirilmesi gerekliliğiydi. İleri yaşta ise (80 yaş üstü) diğer hasta gruplarından farklı olarak en sık nöroloji konsültasyonu nedeni yutma değerlendirmesiydi (n:38). Sonuç olarak nörolojik hastalıklar, PB hastalarında sıkça görülmekte olup, bakım sürecinde sıklıkla yeniden tedavi planlaması, beslenme desteği ve bakım gereksinimleri için nörolojik değerlendirme gerektirebilmektedir.

INTRODUCTION

Palliative care (PC) is an approach aimed at improving the quality of life and managing the symptoms of individuals with advanced-stage illnesses (WHO, 2020). Initially emerging in the treatment of terminally ill cancer patients, it has now evolved to a position where individuals with progressive or multiple coexisting diseases can benefit (Heigener and Rabe, 2011:26; Howlett, 2011:82; Hussain and Russon, 2012:73). Effective implementation of PC requires a comprehensive assessment of the patient's symptoms and needs. Neurological symptoms such as , altered consciousness or sensory symptoms (numbness, tightness, tingling, burning) in 50%, muscle weakness in 29%, vertigo or dizziness in 19%, speech disorder in 17%, and seizure in %11 of these patients were also detected (Liu et al., 2017:20; Anneser et al., 2018:9). These symptoms, especially altered consciousness, muscle weakness, and speech disorder, require attention and detailed evaluation, as they can also be observed in an acute vital neurological disease such as a stroke (Buck et al., 2021:53). At this point, a neurological assessment in patients monitored at PC centers (PCCs) plays a vital role, particularly in those affected by neurological diseases.

The need for neurological assessments in PC may arise during patient referrals and PCC monitoring. In studies conducted by Chahine et al. (2008) on patients seeking PC, neurological or neurosurgical diseases were found to be the second most common reason for referral when excluding cancer as the cause. Anneser et al. (2018) demonstrated that 48% of PC patients without neurological diseases had neurological symptoms when pain was excluded. Ischemic stroke, dementia, amyotrophic lateral sclerosis (ALS) and Parkinson's disease (PD) are the most common neurological diagnoses in patients requiring PC (Liu et al., 2017:20; Sarıçam et al, 2020:26) These diagnoses can be chronic, and during the patient's monitoring, acute conditions, such as stroke, can also develop (Liu et al., 2017:20). The association of the neurology-supported PC model with low hospital admissions and mortality rates highlights the importance of neurological assessments in PCCs (Hussain et al., 2013:19), whose goal is to enhance the quality of life for patients and their families. However, limited studies are addressing neurological assessment in PC patients. Most of these studies are designed by intensive care specialists working in PC with a limited number of cases, emphasizing the need for PC in neurologic diseases. In our country, Sarıçam et al. (2020) also addressed this issue in a similar way. There is no study addressing the need for neurological assessment during the ongoing care process in PC. Based on the lack of information on this subject in the literature, we aimed to investigate the reasons for requesting neurological evaluation and diagnoses of neurological diseases in PCC patients during the treatment process.

2. LITERATURE REVIEW

In this study, PUBMED, COCHRANE Library (The Cochrane Collaboration), Turkish Scientific and Technical Research Council (TUBITAK) ULAKBIM (Turkish Academic Network and Information Center) and MEDLINE (Medical Literature Analysis and Retrieval System) databases were searched. The keywords PC, neurological assessment, neurology consultation, neurological diseases, and neurological symptoms were used to scan the subject.

3. MATERIALS AND METHODS

Between 2020 and 2022, the medical records of patients monitored at our PCC, who were referred for neurological consultation and evaluation, were retrospectively screened. Patient data including age, gender, comorbidities (such as hypertension [HT], diabetes mellitus [DM], hyperlipidemia, coronary artery disease [CAD], atrial fibrillation,

congestive heart failure, chronic kidney disease chronic obstructive pulmonary disease and malignancy), Glasgow Coma Scale (GCS) scores, reasons for neurological assessments and coexisting neurological diseases (such as stroke, multiple sclerosis, dementia, PD, chorea, ALS, epilepsy, cerebral palsy, Guillain-Barre syndrome, encephalitis, trigeminal neuralgia and any other neurological disorders) were recorded. Patients with neurosurgical diseases (neurological malignancy, subarachnoid or subdural haemorrhage, traumatic central or peripheral nerve injury etc.) and missing scanned data were excluded from the study. There is no age or gender limitation in our study. The co-morbidities screened were taken from the data in the patient registry files of our hospital.

3.1. Statistical Methods

The obtained data were analysed using a statistical software package (SPSS) (Version 17, Chicago IL, USA). Descriptive statistics (mean, standard deviation, median, minimum, maximum, count and percentage) were provided for categorical and continuous variables in the study.

3.2. Ethics Committee

Written permission has been obtained from the Ethics Committee of Ankara City Hospital (15 June 2022, number E1-22-2688) for the conduct of this study. Our study was conducted in accordance with research and publication ethics following the principles in the Declaration of Helsinki.

4. RESULTS

This study included 223 patients, with a mean age of 78 (18-98) years, of whom 54.3% were female. The mean GCS score was 10 (4-14). The most common comorbidities were HT (47.5%), DM (29.6%) and CAD (45%). At least one neurological diagnosis was present in 65.5% of the patients. The most frequent neurological diagnoses were dementia (30.9%), stroke (27.4%), PD (12.6%) and epilepsy (10.8%) (see Table 1).

Table 1. Demographic Characteristics, Diagnoses, and Distribution of Neurological Assessments in Patients

	n= 223	**%**
Age*	223	78 (18-98)
Male/Female/**	102/121	45.7/54.3
GCS*	223	10 (4-14)
Comorbidities diseases **		
HT	106	47.5
DM	66	29.6
CAD	45	20.2
Malignancy	36	16.1
AF	16	7.2
COPD	15	6.7
CKD	11	4.9
CHF	8	3.6
HL	6	2.7
Neurological Disease Diagnoses **	146	65.5
Dementia	69	30.9
Stroke	61	27.4
PD	28	12.6
Epilepsy	24	10.8
Cerebral palsy	3	1.3
ALS	2	0.9

MS	1	0.4
GBS	1	0.4
Encephalitis	4	0.4
Trigeminal Neuralgia	1	0.4
Korea	1	0.4

HT; hypertension, DM; diabetes mellitus, HL; hyperlipidemia, CAD; coronary artery disease, AF; atrial fibrillation, CHF; congestive heart failure, CKD; chronic kidney disease, COPD; chronic obstructive pulmonary disease, GCS; Glasgow Coma Scale, MS; multiple sclerosis, PD; Parkinson's disease, ALS; amyotrophic lateral sclerosis
**Values are given as Median (Min-Max).*
*** Values are given as n (%).*

The reasons for neurological consultations included re-treatment planning related to neurological diseases (34.5%), secondary swallowing evaluation for percutaneous endoscopic gastrostomy (PEG) need (29.1%), healthcare documentation requirements (20.6%; medications, guardianship, bed, care and disability) and seizures (5.4%). The most common diagnosis in patients requiring treatment planning was stroke (19.3%). Additionally, urgent neurological events requiring assessment, such as seizures, altered consciousness and stroke, were observed in 11.2% of the patients (see Table 2 and Figure 1).

Table 2. Reasons for Neurology Consultation of Patients

	n= 223	%
Treatment planning	77	34.5
Stroke	43	19.3
Dementia	14	6.3
Epilepsy	14	6.3
PD	6	2.7
Swallowing assessment (PEG requirement)	65	29.1
Healthcare documentation needs	46	20.6
Seizure	12	5.4
Consciousness change	8	3.6
Need for neurology service/Intensive care	8	3.6
Acute stroke	5	2.2
Tremor	1	0.4
Vertigo	1	0.4

** PD; Parkinson's disease, PEG; percutaneous endoscopic gastrostomy*

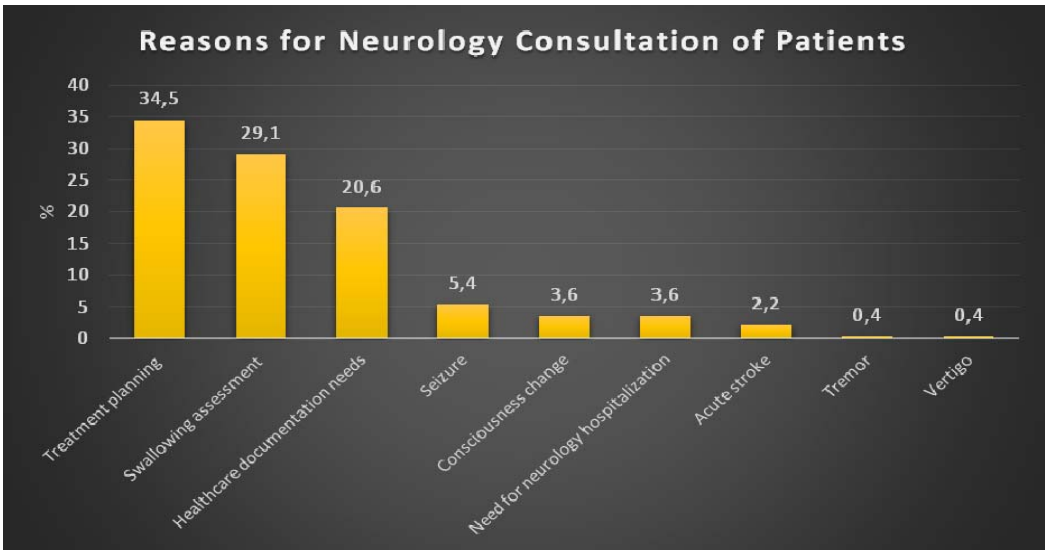

Figure 1. Reasons for Neurology Consultation of Patients

When patients were classified according to age or gender, the most common reason for neurology consultation in women or men or under the age of 80 was the need for evaluation for a treatment plan, especially stroke. At advanced ages (over 80 years of age), the most common reason for neurology consultation was swallowing evaluation (n: 38), unlike other patient groups (see Table 3).

Table 3. Reasons for Neurology Consultation by Age and Gender

	<80 years old		**>80 years old**		**Female**		**Male**	
	n	%	n	%	n	%	n	%
Treatment planning	47	61	30	39	44	57.1	33	42.9
Stroke	31	72.1	12	27.9	27	62.8	16	37.2
Dementia	2	14.3	12	85.7	8	57.1	6	42.9
Epilepsy	12	85.7	2	14.3	6	42.9	8	57.1
PD	2	33.3	4	66.7	3	50	3	50
Swallowing assessment (PEG requirement)	27	41.5	38	58.5	36	55.4	29	44.6
Healthcare documentation needs	25	54.3	21	45.7	27	58.7	19	41.3
Seizure	9	75	3	25	4	33.3	8	66.7
Consciousness change	5	62.5	3	37.5	1	12.5	7	57.5
Need for neurology service/Intensive care	6	75	2	25	4	50	4	50
Acute stroke	2	40	3	60			5	100
Tremor	1	100			1	100		
Vertigo			1	100			1	100

** PD; Parkinson's disease, PEG; percutaneous endoscopic gastrostomy*

5. CONCLUSION AND DISCUSSION

Neurological diseases rank as the second most prevalent category necessitating PC, following cancer (Chahine et al., 2008:15; Gott et al., 2013:29). The convergence of patients with diverse neurological diagnoses, including stroke, PD, dementia, ALS and brain tumours, alongside those with conditions analogous to cancer, often demands re-evaluation by neurologists during hospitalisation (Liu et al., 2017:20; Tran et al., 2016:25). In our study, it was observed that more than half (65.5%) of the patients followed at PCC and requiring neurological evaluation had chronic neurological diagnoses. In this context, with a median age of 78 and a GCS score of 10, symbolising advanced age and a state of stupor, the predominant reasons for neurological consultations encompassed treatment planning, PEG swallowing assessments and documentation needs for healthcare. Moreover, critical neurological events necessitating evaluations, such as seizures, altered consciousness and stroke, were witnessed in 11.2% of patients. In our study, the frequent diagnosis of neurological diseases seen in PC patients, advanced age demographics, retardation in consciousness indicated by low GCS , the need for evaluation of nutrition and care needs, and the ability to monitor acute neurological diseases were found to be compatible with the literatüre (Burge et. al., 2008:53; Liu et al., 2017; Sarıçam et al, 2020:26). These findings underpin the pivotal role of neurological assessments in PC patients, highlighting their pivotal clinical significance in disease management.

The literature has addressed the need for PC and neurological assessments, albeit limited scope. A retrospective study by Liu et al. (2017), which appraised 3170 PC patients, identified neurological diseases in 9.2% of the cases. Similarly, our study corroborates the prominence of chronic diseases, particularly dementia, along with acute conditions, such as ischemic stroke. We posit that the amplified prevalence of neurological diagnoses in our

study may be influenced by our focus on patients referred for neurological consultation and the advanced-age group of our patient cohort. Notably, the apparent scarcity of neurological diagnoses such as ALS, which necessitates frequent palliative care (Liu et al., 2017:20; Sarıçam et al 2020:26), may be because our study's PCC does not encompass the monitoring of mechanically ventilated patients.

Recognising the role of neurology-supported PC in managing progressive neurological diseases, our findings underscore its potential to bolster patients' quality of life, mitigate secondary-symptom burdens and enhance overall care quality (Buzgova, et al., 2020:19). These effects ripple beyond patients to impact their families and caregivers as well (Gorgulu et al., 2016:3). Our study's primary motivations for neurological consultations concur with this ethos, focusing on treatment planning, swallowing assessments for nutritional issues and various health-related documentation requirements, all aimed at enhancing patient comfort.

Advanced age constitutes a notable risk factor for dysphagia (Aslam et al., 2013:9). Within the scope of our research, it was observed that assessments related to swallowing disorders were markedly more prevalent among patients of advanced age, particularly those aged 80 years and older. Failure to address issues related to swallowing difficulties can lead to a decline in pulmonary health and hinder the provision of essential nutritional support (Steidl et al., E., 2015:19, Sura et al., 2012). Within this patient demographic, the consideration of interventions such as swallowing rehabilitation or PEG planning becomes paramount, especially when it is deemed unlikely for dysphagia to naturally ameliorate (Becker et al., 2011:26). At this juncture, neurologic evaluation emerges as a pivotal determinant in formulating an appropriate treatment strategy.

Neurological disease trajectories often diverge from other conditions typically managed by PC specialists, such as cancer, heart disease and lung disease. Thus, the American Academy of Neurology (1996) advocates for neurologists to acquire essential PC skills. The affirmative impact of multidisciplinary teamwork on PC (Fernando et al., 2019:25) accentuates the imperative of integrating neurological expertise within the framework of PC (Dallara et al., 2014:82; American Academy of Neurology, 1996:46). Consequently, the incorporation of neurological specialisation in PC acquires substantial significance. However, neurologists constitute less than 2% of doctors with PC certification (American Board of Psychiatry and Neurology, 2013; Dallara et al., 2014:82) reflecting a paucity in the number of PCCs and neurologists practising within them. We estimate that this rate is even lower in our country. The frequent neurological diagnosis and nutrition observed in PC patients in our study, and the necessity of neurological evaluation on critical issues in the treatment plan, reveal the need for more neurologists to be included in the PC team or to provide training on this subject to the employees in this team. Another point that makes this issue important is that, as seen in our study, palliative care patients may not be able to express their complaints themselves due to their decreased level of consciousness, so the team following the patient has awareness on this issue through the training they receive.

Despite the valuable insights provided by this study, several limitations warrant consideration. The single-center origin of our data and the absence of a larger sample size may impact the generalisability of our findings. Moreover, the exclusion of neurological cases warranting evaluation based on algology or neurosurgery criteria poses a notable limitation.

In conclusion, given the escalating prevalence of neurological diseases among individuals approaching the end of life, the demand for neurological assessments within PC is poised to increase. The pivotal role of neurological

assessments in disease re-treatment planning, nutritional support and care requirements during the PC journey is unmistakable. Aligning with the objective to enhance the quality of life for patients and their families, the contributions of neurologists within the realm of PC remain indispensable. We think that more neurology teams should be involved in the palliative care management process and awareness on this issue should be increased.

AUTHOR CONTRIBUTION STATEMENT

All authors have contributed equally.

THANKS OR SUPPORTS STATEMENT

The study has not received any form of support. There is no institution or individual to be acknowledged for their assistance.

THANKS OR SUPPORTS STATEMENT

There is no conflict of interest with any institution or person within the scope of the study.

REFERENCES

American Academy of Neurology Ethics and Humanities Subcommittee (1996). Palliative care in neurology. *Neurology,* 46, 870-872.

American Board of Psychiatry and Neurology, Inc. (2013). Initial certification statistics. Retrieved June 15, 2023, from http://www.abpn.com/cert_statistics.html.

Anneser, J., Arenz, V., & Borasio, G. D. (2018). Neurological symptoms in palliative care patients. *Frontiers in Neurology,* 9, 275. https://doi.org/10.3389/fneur.2018.00275

Bužgová, R., Kozáková, R., & Bar, M. (2020). The effect of neuropalliative care on quality of life and satisfaction with quality of care in patients with progressive neurological disease and their family caregivers: an interventional control study. *BMC Palliative Care,* 19(1), 1-10. https://doi.org/10.1186/s12904-020-0534-1

Chahine, L. M., Malik, B., & Davis, M. (2008). Palliative care needs of patients with neurologic or neurosurgical conditions. *European Journal of Neurology*, 15(12), 1265-1272. https://doi.org/10.1111/j.1468-1331.2008.02220.x

Dallara, A., & Tolchin, D. W. (2014). Emerging subspecialties in neurology: palliative care. *Neurology*, 82(7), 640-642. https://doi.org/10.1212/WNL.0000000000000247

Fernando, G. V. M. C., & Hughes, S. (2019). Team approaches in palliative care: a review of the literature. *International Journal of Palliative Nursing,* 25(9), 444-451. https://doi.org/10.12968/ijpn.2019.25.9.444

Gorgulu, U., Polat, U., Kahraman, B., Ozen, S., & Arslan, E. (2016). Factors affecting the burden on caregivers of stroke survivors in Turkey. *Medical Science and Discovery,* 3(4), 159-165.

Gott, M., Gardiner, C., Ryan, T., et al. (2013). Prevalence and predictors of transition to a palliative care approach among hospital inpatients in England. *Journal of Palliative Care,* 29, 147-153.

Heigener, D. F., & Rabe, K. F. (2011). Palliative care concepts in respiratory disease. *Respiration,* 82, 483-491. https://doi.org/10.1159/000334189

Howlett, J. G. (2011). Palliative care in heart failure: addressing the largest care gap. *Current Opinion in Cardiology,* 26, 144-148. https://doi.org/10.1097/hco.0b013e3283437468

Hussain, J. A., & Russon, L. (2012). Supportive and palliative care for people with end-stage renal disease. *British Journal of Hospital Medicine,* 73, 640-644. https://doi.org/10.12968/hmed.2012.73.11.640

Hussain, J., Adams, D., & Campbell, C. (2013). End-of-life care in neurodegenerative conditions: outcomes of a specialist palliative neurology service. *International Journal of Palliative Nursing,* 19, 162-169. https://doi.org/10.12968/ijpn.2013.19.4.162

Liu, Y., Kline, D., Aerts, S., Youngwerth, J. M., Kutner, J. S., Sillau, S., & Kluger, B. M. (2017). Inpatient palliative care for neurological disorders: lessons from a large retrospective series. *Journal of Palliative Medicine*, 20(1), 59-64. https://doi.org/10.1089/jpm.2016.0247

Sarıçam, G., Kahveci, K., & Akdoğan, D. (2020). Palliative Care Requirement in Neurologic Diseases. Turkish *Journal of Neurology/Turk Noroloji Dergisi,* 26(2). https://doi.org/10.4274/tnd.galenos.2019.46910

Tran, L. N., Back, A. L., & Creutzfeldt, C. J. (2016). Palliative care consultations in the neuro-ICU: a qualitative study. *Neurocritical Care,* 25, 266-272. https://doi.org/10.1007/s12028-016-0306-1

World Health Organization (WHO) (2020). Palliative care. Retrieved June 20, 2023, from https://www.who.int/news-room/fact-sheets/detail/palliative-care.