

Original Article

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An evaluation of Portuguese radiation oncologists knowledge and practice in relation to geriatric oncology

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Abstract

Introduction: Cancer is a major health concern in Portugal, especially among older adults, who represent nearly half of new cases. Radiation therapy (RT) is crucial in their treatment, emphasizing the need for improved education in geriatric oncology for radiation oncologists (RO).

Methods: A pretested 22-item online survey on RO's geriatric oncology knowledge was disseminated.

Results: The analysis involved 52 respondents, including 13 residents (25%) and 39 consultants (75%); RO were asked to specify the age threshold they considered to define an older cancer patient. Their responses were as follows: 60 years ($n = 2$, 3.8%), 65 years ($n = 7$, 13.5%), 68 years ($n = 1$, 1.9%), 70 years ($n = 29$, 55.8%), 75 years ($n = 10$, 19.2%) and 80 years ($n = 2$, 3.8%). Forty-six respondents (88.5%) acknowledged an observed increase in the number of older cancer patients in RT departments. Twenty-nine participants (55.8%) reported that age was considered either most of the time or always in clinical decisions. Regarding frailty screening, it was performed by 15 participants (28.8%), while four participants (7.7%) stated that frailty was assessed during comprehensive geriatric assessment in another department. Of those implementing screening tools, nine (17.3%) utilized the G8 tool, and two respondents (3.8%) employed the Triage Risk Screening Tool. Most respondents reported a lack of awareness regarding specific guidelines for older cancer patients, and 98.1% expressed the need for enhanced training in geriatric oncology.

Conclusion: The study highlights a critical need for improved training in geriatric oncology among RO professionals. Furthermore, the findings underscore the imperative for treatment decisions to reflect an understanding beyond chronological age, emphasizing the necessity of addressing this knowledge gap in clinical practice.

Highlights

- The analysis encompassed 52 respondents, primarily consisting of 75% RO consultants and 25% residents, falling short of the intended sample size.
- Findings, reported with a 90% confidence level and 10% margin of error, highlighted a predominantly female representation (56.6%) and a significant proportion (51.9%) working in university hospitals.
- Radiation oncologists' expertise spanned various cancer subtypes, with age significantly influencing clinical decision-making. Frailty assessment was underutilized.
- Despite limited awareness of guidelines specific to older cancer patients and sparse staff resources for comprehensive geriatric assessments, there was a recognized need for enhanced training in geriatric oncology among respondents.

Introduction

In the Portuguese context, cancer is the second major cause of both mortality and morbidity, accounting for 28,544 cancer-related deaths, approximately constituting 25% of the overall mortality.¹ Notably, nearly half of these new cancer cases occur within the older adult population aged above 70 y/o or over.² Approximately 45–55% of new cancer cases may require radiation therapy (RT), with an expected 20–30% increase due to demographic changes. RT is commonly used in older adults with cancer, often alongside surgery, chemotherapy, and/or immunotherapy.³

Older cancer patients frequently formulate treatment decisions based upon a basis of trust in their healthcare providers, adhering to the recommendations offered by their physicians.⁴



Physicians, especially radiation oncologists (RO), should acknowledge that the predictive value of chronological age in assessing tolerance and outcomes for older adults with cancer is limited. In light of this recognition, treatment decisions must be informed by an understanding of the complex interplay of factors influencing the health and outcomes of this population.⁵ One of the most important concepts in this context is frailty, a multisystem syndrome characterized by diminished physiological reserves, mirroring alterations across tissues and organs. This phenomenon is intricately linked with geriatric syndromes, multimorbidity, and the physiological changes such as senescence, collectively reflecting ageing's complexity.⁶

There is a growing emphasis on personalized and patient-centred approaches. Within this context, the perspectives of RO on geriatric oncology play a critical role in shaping treatment strategies for older cancer patients. Despite the increasing recognition of the challenges associated with cancer in the geriatric population, a notable gap exists in the literature regarding the specific viewpoints of RO on geriatric oncology in the context of Portugal, where there is no specialized geriatric medical specialty.

Given the 2021 statistics indicating 172 (80%) registered consultants and 43 (20%) residents in radiation oncology across Portugal, training initiatives should be strategically tailored to meet the specific needs and availability of both residents and consultants.^{7–11} The findings from this research can play a pivotal role in enhancing existing training programmes, ensuring that RO, including both residents and experienced consultants, are adequately equipped to navigate the distinctive challenges inherent in the treatment of older cancer patients.

Moreover, given the critical role of RT in improving outcomes for older adults with cancer, there is a pronounced need for improved educational initiatives within the domain of geriatric oncology.^{12,13} RO must anticipate and address the unique needs of older patients, with a focus on having access to frailty status, ideally assessed through a Comprehensive Geriatric Assessment (CGA). When such an assessment is not available, RO must be familiar with frailty screening tools.⁵ Additionally, it is important to enhance communication by directly assessing information needs, balancing realism with hope, recognizing non-survival goals, and employing techniques to reduce miscommunication.¹⁴ This research aimed to examine the understanding of geriatric oncology among Portuguese RO, with the objective of assessing their current knowledge in this field.

Methods

Ethics

This study was approved by Research Ethics Committee from the School of Medicine and Biomedical Sciences, University of Porto, Portugal (reference 2021/CE/P026 (P366/CETI/ICBAS)). Informed consent was obtained for all the participants.

Development of the survey instrument

A 22-item online survey assessing RO's perspectives in geriatric oncology underwent a pretest with 10 individuals from Centro Hospitalar Universitário São João's Radiotherapy Department to ensure consistency and content clarity. This survey was developed based on literature review and investigator consensus.¹⁵ Some questions found in the literature were adapted to the Portuguese reality and to the absence of geriatrics as an established specialty in the country. After refining the pretest, the finalized survey was

distributed. The final distributed version of the survey is available on supplementary data.

The questionnaire covered RO characteristics (gender, age, professional details, cancer type experience), institutional factors (type, geriatric assessment availability), geriatric knowledge (training, age categorization), patient management (age-related treatment variations, informal/formal geriatric assessments, frailty screening), awareness of international recommendations for older cancer patients and future training needs. The question about the use of frailty screening tools included Geriatric-8 (G8), Vulnerable Elders Survey-13 (VES-13) and Triage Risk Screening Tool. These were selected based on previous publications that state that an abnormal result on these has been established as associated with functional decline and poorer survival.¹⁶ The authors aimed to increase awareness about International Geriatric Radiotherapy Group, so a question asking about it was created. This group was founded in 2012 by 15 radiotherapy institutions in the United States and Europe and aims to improve radiotherapy techniques for older cancer patients, enhancing their chances of cure and quality of life.¹⁷

Participants

The study encompassed RO (consultants and residents) actively involved in cancer patient care in Portugal. The entire eligible cohort comprised 43 residents and 172 consultants, identified through the Portuguese Medical Council statistics database. The sample size was estimated to be 139, with 95% confidence level and a margin of error of 5%. The online survey was distributed to department directors and presented during in-person meetings across five Portuguese radiotherapy departments. The responses were obtained between November 2021 and April 2022. No financial incentives were provided for survey completion, and based on pilot testing, the survey was designed to be completed in less than 10 min.

Data analysis

We conducted summary descriptive analyses on responses obtained from this survey. Also, the pattern of responses was compared between consultants and residents. The survey confidence level and margin of error were calculated according to Serdar *et al.*¹⁸

We employed crosstab analysis to compare frailty screening and CGA utilization rates between residents and consultants. IBM® SPSS® Statistics version 27 and Microsoft Office 365 Apps for Enterprise—Excel® were employed for conducting both descriptive and statistical analyses.

Statistical significance was considered to differences with a *p*-value below 0.05.

Results

In this analysis, 52 respondents were included, comprising 13 residents (25%) and 39 consultants (75%) in RO. The estimated sample size of 139 was not met, and the outcomes of this study are reported with a confidence level of 90% and a margin of error of 10%. Of the total respondents, 31 (56.6%) were female, and 27 (51.9%) worked at a university hospital. Consultant expertise covered various cancer subtypes: genitourinary (*n* = 15, 28.8%), breast (*n* = 15, 28.8%), gastrointestinal (*n* = 13, 25%), head and neck (*n* = 13, 25%), lung (*n* = 11, 21.2%), central nervous system

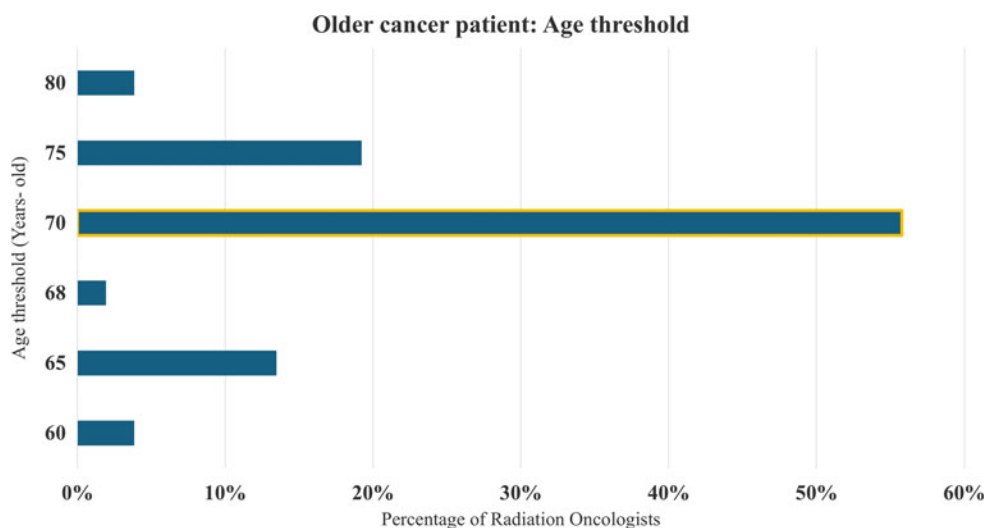


Figure 1. Representation of the age thresholds that radiation oncologists considered for defining a cancer patient as older.

($n = 7$, 13.5%), haematology ($n = 9$, 17.3%), gynaecology ($n = 6$, 11.5%) and skin/sarcomas ($n = 6$, 11.5%).

In relation to pre-graduate training in geriatrics within the context of RO, four participants (7.7%) reported having received such training. Post-graduate training in geriatrics was reported by one respondent (1.9%). Seven respondents (13.5%) indicated the presence of a designated professional for geriatric oncology within their respective hospitals. However, only six participants (11.5%) affirmed the availability of staff resources for the implementation of a CGA.

More than half of the RO considered 70 years old as the threshold for defining an older cancer patient, as illustrated in Figure 1.

The clinical decision-making process was predominantly influenced by age, with 29 participants (55.8%) reporting that age was considered either most of the time or always. Concerning awareness of guidelines specific to older cancer patients, 26 respondents (50%) reported familiarity with National Comprehensive Cancer Network—NCCN Older Adult Oncology Guidelines, 13 (25%) with American Society of Clinical Oncology—ASCO, three (5.8%) with International Society of Geriatric Oncology—SIOG, 19 (36.5%) with European Organisation For Research And Treatment Of Cancer—EORTC, and 17 (32.7%) indicated awareness of none. Most respondents, comprising 38 individuals (73.1%), indicated a lack of awareness regarding the International Geriatric Radiotherapy Group. Regarding frailty screening, it was performed by 15 participants (28.8%), while four participants (7.7%) stated that frailty was assessed during CGA in another department. Of those implementing screening tools, nine (17.3%) utilized the G8 tool, and two respondents (3.8%) employed the Triage Risk Screening Tool.

In routine clinical practice, RO reported assessing various domains of older persons, encompassing walking ($n = 13$, 25%), activities of daily living ($n = 34$, 65.4%), instrumental activities of daily living ($n = 4$, 7.7%), nutrition ($n = 7$, 13.5%), cognition ($n = 23$, 44.2%), depression ($n = 2$, 3.8%), comorbidities ($n = 10$, 19.2%), social aspects ($n = 27$, 51.9%), polypharmacy ($n = 22$, 42.3%) and falls ($n = 11$, 21.2%).

A significant proportion, 46 respondents (88.5%), acknowledged an observed increase in the number of older cancer patients attending RO departments. Furthermore, 51 participants (98.1%)

expressed the need for enhanced training in geriatric oncology. The preferred methods for training included case studies discussions ($n = 27$, 51.9%), workshops ($n = 23$, 44.2%), constitution of cancer type-specific interest groups ($n = 26$, 50%) and easy access to international geriatric oncology guidelines ($n = 34$, 65.4%).

There were no significant differences between the answers from consultants and residents for all the questions, as shown in Table 1 and Figure 2.

Discussion

This analysis involved 52 respondents, including 13 residents (25%) and 39 consultants (75%) in RO, with diverse expertise covering various cancer subtypes. Most of the respondents reported a lack of awareness regarding guidelines for older cancer patients, and 98.1% expressed the need for enhanced training in geriatric oncology. The preferred training methods included case studies discussions, workshops, constitution of cancer type-specific interest groups and easy access to international geriatric oncology guidelines.

Our findings indicate that a minority of respondents had received training in geriatrics. This aligns with the outcomes of a cross-sectional online survey distributed across 45 cancer centres in Australia, New Zealand and Singapore, revealing that 91.8% of respondents had not undergone any formal or informal instruction related to geriatric oncology during their radiation oncology training.¹⁹ Our findings, in conjunction with literature, highlight that the lack of training in geriatrics is common among RO regardless of the country of practice.

Approximately half of the survey participants mentioned that age significantly impacts clinical decision-making. Unfortunately, this trend aligns with findings from a comprehensive scoping review, emphasizing the prevalent use of patient age, either explicitly or implicitly and consciously or unconsciously, as a determinant in guiding clinical decisions in cancer care.²⁰ Additionally, there is evidence that healthcare professionals have negative biases toward older women with breast cancer resulting in less optimal care. Neal et al performed a study that used the Implicit Association Test to assess healthcare professionals' biases toward older women, revealing a moderate negative implicit association with older women ($M = 0.52$, $p < 0.001$). These biases may influence treatment decisions, leading to assumptions that

Table 1. Comparison of responses between residents and consultants in radiation oncology

	Total		Residents		Consultants		<i>p</i>
	(n = 52)		(n = 13)		(n = 39)		
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	
Gender							
Female	31	59.6	10	76.9	21	53.8	0.142
Male	21	40.4	3	23.1	18	46.2	
Workplace							
University hospital	27	51.9	8	61.5	19	48.7	0.091
Tumour-specific expertise							
Genitourinary	15	28.8	0	0.0	15	38.5	0.006
Breast	15	28.8	0	0.0	15	38.5	0.006
Gastrointestinal	13	25.0	0	0.0	13	33.3	0.013
Head and Neck	13	25.0	0	0.0	13	33.3	0.013
Lung	10	19.2	0	0.0	10	25.6	0.040
Central nervous system	7	13.5	0	0.0	7	17.9	0.171
Haematology	9	17.3	0	0.0	9	23.1	0.011
Gynaecology	6	11.5	0	0.0	6	15.4	0.160
Skin/sarcomas	6	11.5	0	0.0	6	15.4	0.160
Geriatric training							
Pre-graduated	4	7.7	1	7.7	3	7.7	1.000
Pos-graduated	1	1.9	0	0.0	1	2.6	1.000
CGA available at institution	6	11.5	1	7.7	5	12.8	1.000
Decision-making process heavily influenced by age	29	55.8	9	69.2	29	74.4	0.341
Awareness about geriatric oncology-specific guidelines							
NCCN Older Adults Oncology	26	50.0	8	61.5	18	46.2	0.523
SIOG	3	5.8	0	0.0	3	7.7	0.564
EORTC	19	36.5	5	26.3	14	35.9	1.000
ASCO	13	25.0	5	38.5	8	20.5	0.269
None	17	32.7	4	30.8	13	33.3	1.000
Frailty screening tools used in RO practice							
Frailty screening performed	15	28.8	1	7.7	14	35.9	0.049
Frailty assessed during CGA in another department	4	7.7	0	0.0	4	10.3	0.304

(Continued)

Table 1. (Continued)

	Total		Residents		Consultants		<i>p</i>
	(n = 52)		(n = 13)		(n = 39)		
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	
G8	9	17.3	1	7.7	8	20.5	0.275
TRST	2	3.8	0	0.0	2	5.1	0.559
VES-13	0	0.0	0	0.0	0	0.0	NA
CGA domains evaluated in RO practice							
At least one domain evaluated	46	88.5	12	92.3	34	87.2	0.528
Complete CGA performed	3	5.8	0	0.0	3	7.7	0.414
Walking	13	25.0	4	30.8	9	23.1	0.415
ADL	34	65.4	9	69.2	25	64.1	0.507
IADL	4	7.7	1	7.7	3	7.7	0.696
Nutrition	7	13.5	2	15.4	5	12.8	0.568
Cognition	23	44.2	7	53.8	16	41.0	0.629
Depression	2	3.8	0	0.0	2	5.1	0.559
Comorbidities	10	19.2	1	7.7	9	23.1	0.214
Social	27	51.9	7	53.8	20	51.3	0.564
Polypharmacy	22	42.3	7	53.8	15	38.5	0.517
Falls	11	21.2	2	15.4	9	23.1	0.438

ADL, Activities of daily living; ASCO, American Society of Clinical Oncology; CGA, Comprehensive geriatric assessment; EORTC, European Organisation for Research and Treatment of Cancer; G8, Geriatric 8; IADL, Instrumental activities of daily living; NA, Not applicable; RO, Radiation Oncology; TRST, Triage Risk Screening Tool; VES-13, Vulnerable Elders-13 Survey; SIOG, International Society of Geriatric Oncology.

older patients are less capable of decision-making or prefer less aggressive treatments.²¹ The findings published in the literature along with the results from our survey emphasize the need for objective assessments to counteract age-based assumptions and ensure personalized, evidence-based treatment for older cancer patients.

Regarding the utilization of frailty screening tools within the context of RT, approximately one-third of our study respondents reported their implementation. Despite no specific data being available regarding the use of frailty screening tools within the scope of RT, an international survey addressing frailty assessment in cancer patients revealed a 37% utilization rate among European respondents. In this international survey, reasons cited for the non-utilization of screening tools included lack of awareness, time constraints and a perceived lack of associated benefits.²²

The relationship between frailty and RT, as well as its potential role as a predictor of radiotoxicity and other clinical outcomes, remains inadequately understood. A cohort study found that frailty or vulnerability, as assessed by the G-8, VES-13, or Fried phenotype, was linked to higher rates of radiotoxicity, with areas under the curve of 0.86, 0.79, and 0.61, respectively.²³ A different prospective study investigating the Edmonton Frail Scale as a predictor of radiotoxicity in older patients found no significant statistical correlation.²⁴ Data from head and neck cancer patients

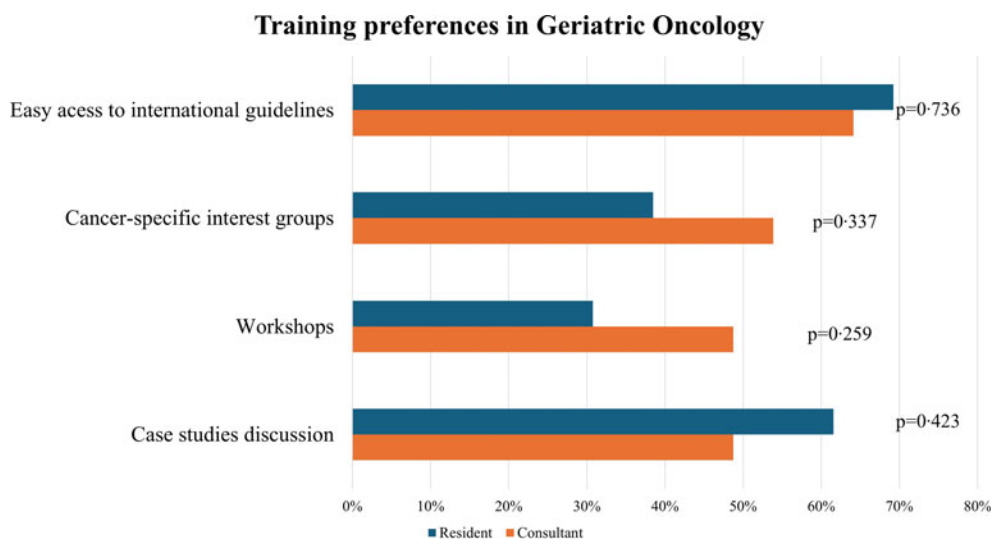


Figure 2. Comparison between responses within residents and consultants in radiation oncology (RO), regarding their training needs and preferences.

indicate that frailty, assessed using the CGA, Groningen Frailty Indicator, and G-8, as well as limitations in geriatric domains, were not linked to acute radiation-induced toxicity.²⁵ In patients with early-stage non-squamous cell lung cancer undergoing stereotactic RT, the modified frailty index (mFI) was associated with a reduced 3-year overall survival compared to those considered fit (37.3 vs 74.7%; $p = 0.003$). However, the higher mortality rate appeared to be primarily attributed to factors unrelated to lung cancer.²⁶ Another study found that in this patient group, frailty, as assessed by the mFI, was a significant predictor of decreased overall survival (HR = 1.98, 95% CI 1.02–3.85, $p = 0.04$).²⁷ Data from a Greek RT department indicate that, among patients aged 75 or older receiving curative or palliative RT, a VES-13 score greater than 3 was linked to a 2.12-fold higher likelihood of an incomplete RT course, with this likelihood increasing to 3.34 times higher when the score exceeded 7.²⁸ In urological cancer patients undergoing initial surgery or radiotherapy, those classified as frail based on the CGA had a higher risk of cancer-related hospitalizations compared to their fit counterparts (OR = 6.79, 95% CI 1.42–32.51).²⁹ These findings underscore the critical importance of assessing frailty status in older adults proposed for RT, as it may facilitate the identification of individuals at increased risk for adverse outcomes. Furthermore, such assessments could enable the development of personalized treatment strategies, in this manner optimizing the potential benefits of RT for each older patient.

In the context of interpreting the domains evaluated within RT, our findings indicate that social aspects are the most frequently assessed, with cognition following closely. Notably, while pertinent data specific to the geriatric assessment domains within radiation oncology are not presently available, recent insights derived from a survey conducted by the ASCO reveal that cognitive assessment prominently ranks among the top five domains evaluated in the geriatric assessment of older adults with cancer. In accordance with these results, the assessment of functional status and falls predominates among the frequently employed tools in geriatric assessment. Additionally, other tools were utilized, involving evaluations of weight loss, comorbidities, life expectancy, chemotherapy toxicity, mood, and noncancer mortality risk.³⁰

The observed increase in older cancer patients attending RT departments, acknowledged by the majority of respondents, aligns with published projections. Over the next two decades, Europe is predicted to witness a notable increase in the number of new cancer

cases annually, reaching 4.5 million, with 65% and 50% of patients aged over 65 and 75, respectively. By 2050, the typical cancer patient in Europe is expected to be 70 years of age or older, reflecting the significant demographic change.³¹

Furthermore, most participants emphasized the critical need for further training in geriatric oncology. Comprehensive training is imperative for healthcare professionals, as it is crucial for them to recognize that chronological age inadequately predicts tolerance and outcomes in older adults with cancer, emphasizing the need for treatment decisions to reflect this understanding.⁵ Expanding on this imperative, Morris et al. contribute valuable insights by providing an extensive compilation of global educational courses and strategies tailored to meet the upcoming training needs.¹²

The authors would like to highlight that this study has several limitations. The number of respondents falls short of the minimum threshold of 139 required to achieve a 95% confidence level with a 5% margin of error. Another limitation of this study is the use of closed-ended questions, which limited participants' ability to elaborate on their responses. Including open-ended text boxes would have provided valuable data. Nevertheless, this pilot study underscores the necessity for further training in geriatric oncology and the importance of having dedicated geriatricians working alongside RO.

Conclusion

Our study highlights the imperative for enhanced training in geriatric oncology among radiation oncology professionals, given the prevailing lack of awareness, limited geriatric training and the need to recognize that chronological age poorly predicts tolerance and outcomes in older adults with cancer, emphasizing the necessity for treatment decisions to reflect this understanding.

Supplementary material. The supplementary material for this article can be found at <https://doi.org/10.1017/S1460396924000347>.

Authorship. Edna Darlene Rodrigues ensured the integrity of the entire study, contributed to study concepts and design, conducted literature research, performed statistical analysis and participated in manuscript preparation and editing. Paulo Almeida served as a guarantor of integrity for the entire study, conducted literature research and participated in manuscript editing. Escarlata López Ramírez also served as a guarantor of integrity for the entire study, conducted literature research and participated in manuscript editing. Laetitia Teixeira served as a guarantor of integrity for the entire study, conducted

literature research, performed statistical analysis and participated in manuscript editing.

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Competing interests. The authors of this paper have no conflicts of interest to disclose related to the findings presented.

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