HEALTH SERVICES RESEARCH

Cross-Sectional International Survey to Determine the Educational Interests of Spanish-Speaking Latin American Radiation Oncologists

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PURPOSE With the existing oncology disparities in Latin America, physician expertise has been cited as a possible contributor to inferior oncologic outcomes in some cancers. As two-dimensional radiotherapy rapidly evolved to intensity-modulated radiation therapy in Latin America, adequate contouring education is an actionable target to improving physician knowledge and clinical outcomes. Yet, topics of interest to Latin American radiation oncologists are underreported. We assessed Latin American interest in a virtual platform for case discussion and identified the educational topics of most interest to them.

MATERIALS AND METHODS A Spanish-language online survey was designed by a team of Latin American educators. The questions assessed professional nationality, desire for an online educational platform for case presentation, career length, and topics of interest. Educational topics included head and neck (H&N), CNS, GI, lung, gynecologic, breast, and pediatric cancers, lymphoma, sarcoma, stereotactic body radiotherapy (SBRT), brachytherapy, and medical physics.

RESULTS One hundred thirty-three surveys were included for analysis. Overall, 127 respondents (98%) affirmed interest in participating in a virtual platform for case discussion and treatment advances. The most popular educational themes were H&N cancers (24%), SBRT (14%), and CNS cancers (13%). Of countries with > 10 respondents, the most popular educational topic remained H&N cancers for Argentina, Chile, and Mexico, but the most popular topic among Peruvian respondents was CNS cancer (27%).

CONCLUSION With international collaboration and a large sample size, we present the first survey results describing Latin American radiation oncology educational interests. Participants were overwhelmingly interested in a virtual platform, and most were specifically interested in H&N cancer education. These results can be used for focused didactic preparation in Latin America. Future efforts should expand on improving representation and outreach among Central American radiation oncologists.

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BACKGROUND

Medicine has been called an art and, in the case of radiation oncology, which requires delineation of tumors and sensitive anatomical structures, that idea is evident in more ways than one. Radiotherapy technology has evolved from two-dimensional (2D) treatment planning, in which physicians outlined treatment areas by drawing on x-rays, to computed tomography-based planning or three-dimensional (3D) planning, which requires delineation on a computer. This technological evolution—and the subsequent evolution from 3D planning to even more conformal intensity-modulated radiation therapy (IMRT)—has led to improved patient outcomes, particularly by reducing treatment toxicity.[1,2] Conversely, improper contouring has been associated with relapse. Transitioning from the historic method of drawing fields on an x-ray film to computer-based delineation of tumor volumes and organs at risk (axial slice by axial slice) requires training. Although the evolution from 2D to IMRT techniques occurred over a 15-year period in the United States, in some Latin American countries, the transition occurred in just 3-4 years. When considering cancer outcomes, this accelerated shift is worth examining, since physician expertise has been cited as a possible explanation for disparities in cancer outcomes for some cancers in Latin America, such as pediatric cancers.[3] Hence, contouring expertise represents an actionable target not only for improving education but also for improving cancer outcomes in terms of control and toxicity.

To address professional education goals, e-contouring workshops have given a medium for providing instruction to radiation oncologists, both trainees and

ASSOCIATED CONTENT

Data Supplement

Author affiliations and support information (if applicable) appear at the end of this article.

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CONTEXT

Key Objective

To identify Spanish-language Latin American interest in a virtual platform for radiation oncology case discussion and topics most interesting to respondents.

Knowledge Generated

Ninety-eight percent of respondents affirmed interest in a virtual platform for case discussion. The most popular education themes were head and neck cancers, stereotactic body radiotherapy, and CNS cancers.

Relevance

The first survey results describing Spanish-speaking Latin American radiation oncology educational interests are presented. These results can be used for focused didactic preparation in Spanish-speaking Latin America.

those in practice. These workshops provide an interactive educational space for attendees to learn and review contours. Although a recent systematic review evaluated the methodologies and results of such e-contouring workshops,[4] no experiences from Latin America or Africa were included, reflecting existing disparities in education and clinical outcomes. We have reported our experiences with lymphoma education in Argentina and e-contouring in Peru, but our findings have been challenged by the low completion rates of our postsession assessments,[5,6] which precludes proper evaluation of educational success.

To address the low participation rates we have faced in postsession assessments, we designed a survey to identify topics of interest to Latin American radiation oncologists and establish their level of interest in a virtual platform for contouring education and case discussion. We hypothesized that low completion rates of postsession assessments might reflect low interest in presented topics and that identification of high-interest topics might increase future participation and postsession assessment completion. We sought to assess Latin American interest in a virtual platform for case discussion and identify which educational topics are of most interest.

MATERIALS AND METHODS

Under institutional review board approval (IRB) of IRB202000003 at the University of Florida, a cross-sectional international Spanish-language survey of targeted Spanish-speaking Latin American radiation oncologists was conducted from October 17, 2019, to November 22, 2019, by a team of radiation oncologists practicing in Chile, Mexico, Peru, and the United States. Owing to the authors' linguistic background, Spanish was selected as the language for distribution. R.B.M.V., B.A., D.D.L.M., A.P., G.S., S.S., and P.H. contributed to the selection of survey questions. A literature review determined that no previous surveys had been designed to evaluate our question of radiotherapy topic interest for Spanish-speaking radiation oncologists in Latin America. Consensus of the aforementioned authors determined ultimate question selection. The survey was designed using the Qualtrics survey platform (Qualtrics, Provo, UT) and distributed via electronic mail.

Distribution was performed by all authors. R.B.M.V. and B.A. are American-residing Latin radiation oncologists who regularly provide Spanish instruction at Latin American oncology conferences. D.D.L.M., A.P., G.S., and S.S. similarly provide Spanish instruction at conferences and serve in national radiation oncology leadership roles with access to radiation oncologists throughout their countries. B.L. serves in a leadership role with the broader Latin American Radiation Oncology Residency Group. Owing to the IRB approval, the methodology for distribution was through snowball sampling; R.B.M.V. sent the survey to D.D.L.M., G.S., S.S., and B.L., who subsequently contacted their respective parties because the approval nature stipulated that R.B.M.V. would not gain contact information through the survey. In addition to personal contacts, D.D.L.M., G.S., and S.S. distributed surveys through their respective national radiation oncology societies, and B.L. distributed surveys through the Rayos Contra Cancer education and training network. A more detailed methodology description of survey design and distribution alongside our Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) checklist is included in the Data Supplement.

The survey assessed respondent demographic information. We asked participants to identify in which country they practice, their years in practice (including training), and whether they had the desire to participate in an online educational platform for case presentation. Years in practice were categorized into 0-5, 6-10, 11-15, 16-20, 21-25, and $>$ 25 years. We also asked participants their preferred time of day for such an online session; options included each day of the work week (Monday through Friday) and four time blocks: morning, noon, afternoon, and after work (eg, Tuesday afternoon was an option). Respondents could choose from 40 possible time blocks. To determine specific educational interests, we asked participants to rank a predefined list of topics from most to least interesting. Topics included head and neck (H&N),

CNS, GI, lung, gynecologic, breast, and pediatric cancers, lymphoma, sarcoma, stereotactic body radiotherapy (SBRT), brachytherapy, and medical physics. Finally, we provided respondents with an opportunity to list topics of interest not included from our predefined list. A copy of the complete six-item survey is included in the Data Supplement.

Descriptive statistics were employed. We defined a descriptive variable called the mean topic value (MTV) to represent the average score of interest in a topic, with lower scores indicating more interest and a value of 1 indicating unanimous agreement that the topic was of most interest. Similarly, with 10 respondents, if 5 selected topic X as their first choice and 5 selected topic X as their tenth choice, MTV = Σ(individual topic preference selection)/number of participants = 5.5. Hence, a lower score indicated stronger preference. Apart from MTV, we performed specific subgroup analyses to evaluate the most popular topics by years of experience and nationality of respondent for those countries if more than 10 respondents completed the survey. Incomplete surveys were not included for statistical analysis or reporting.

RESULTS

Of 138 surveys attempted, 133 were completed and included for analysis. Respondent nationality in order of frequency included Chile (31%), Peru (23%), Mexico (20%), Argentina (9%), the Dominican Republic, Spain, Bolivia, Colombia, Paraguay, Uruguay, Ecuador, El Salvador, and Brazil. Figure 1 illustrates a geographic representation of respondent countries. All respondents were radiation oncologists in practice (including residency) at a mean and median of 8.7 and 7 years, respectively (range, 1-47 years; 25th and 75th quartiles, 3 and 10 years). Figure 2 presents a histogram of respondent experience in radiation oncology. Overall, 127 respondents (98%) affirmed interest in participating in a virtual platform for case discussion and treatment advances.

Of a list of times that were most convenient to meet, 345 selections were made by the 138 survey responders. The most common time, with 41 respondents (30%), was Friday after work. The second and third most common times selected were Thursday after work (24%) followed by Wednesday and Tuesday after work (both 22%).

Educational Interests

The most popular educational topics selected as being of most interest were H&N cancers (24%), SBRT (14%), and CNS cancers (13%) (Table 1). When we evaluated favorite topics within countries with > 10 respondents, the most popular educational topic remained H&N cancers for Argentinian, Chilean, and Mexican respondents but CNS cancers for Peruvian respondents (27%). In respective order, the most popular topics from Chilean respondents were H&N cancers (25%) and SBRT (17%), with GI (12%) and genitourinary cancers (12%) being the third most popular. Similarly, the most popular topics for Mexican respondents were H&N (33%), breast (19%), and lung cancers (15%). For Peruvian respondents, CNS cancers (27%) were most popular followed by gynecologic cancers (20%) and SBRT (17%). Argentinian respondents were most interested in H&N (42%) followed by CNS (17%) and gynecologic cancers (17%).

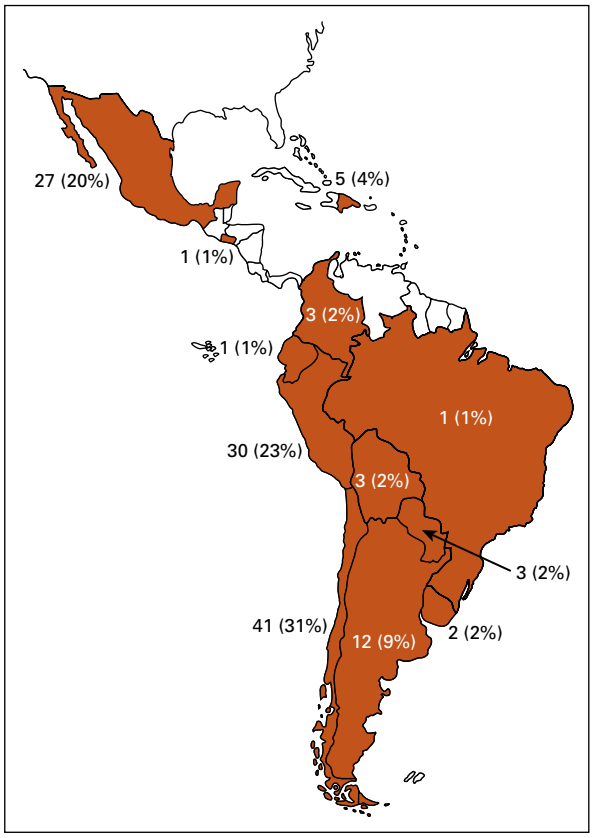

FIG 1. Geographic representation of survey respondents.

We also evaluated the MTV as described above (Table 2). When incorporating all topic selections to determine the most favorable topics by MTV, the most popular topics were H&N (MTV = 4.11), CNS (MTV = 4.93), and breast cancers (MTV = 5.28) (Table 2).

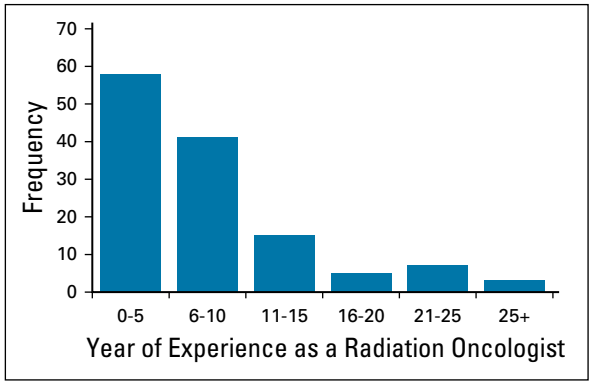

FIG 2. Histogram of survey respondents by career stage.

TABLE 1. Sites Ranked by First Choice[a]

Site	Rate of Respondents, n (%)
H&N	32 (24.24)
SBRT	18 (13.64)
CNS	16 (12.12)
Gynecologic	12 (9.09)
Breast	12 (9.09)
Brachytherapy	11 (8.33)
GI	7 (5.30)
Genitourinary	7 (5.30)
Lungs	6 (4.55)
Pediatrics	6 (4.55)
Medical physics	3 (2.27)
Lymphoma	2 (1.52)
Sarcoma	0 (0.00)

Abbreviations: H&N, head and neck cancer; SBRT, stereotactic body radiotherapy.

[a]For example, 32 or 24% of respondents listed H&N cancer as their first topic of interest.

Participating radiation oncologists could also suggest topics. Topics suggested by more than one respondent included stereotactic radiosurgery (n = 14), benign tumors (n = 7), palliative treatment (n = 5), radiobiology (n = 5), immunotherapy (n = 2), and teamwork (n = 2).

Responses by Experience

We categorized experience into four groups based on years of experience: newer physicians (0-4 years), junior attendings (5-9 years), mid-level attendings (10-19 years), and senior attendings (> 20 years) representing 37%, 30%, 24%, and 9% of the survey respondents. For senior attendings, the most common topic of interest was H&N (33%) followed by GI (17%), pediatric (17%), and genitourinary cancers (17%). For mid-level attendings, the most common topics were SBRT (29%), GI (16%), and H&N cancers (13%). For junior attendings, the most common topics were H&N (21%) and CNS cancers (21%) followed by gynecologic (13%) and breast cancers (13%). Finally, for newer physicians, the most common topics were H&N cancer (33%), gynecologic cancer (15%), and SBRT (10%).

Of senior and mid-level attendings, Chilean physicians represented the most common respondents at 50% and 48%, respectively. For junior attendings and newer physicians, Peruvian physicians (37%) and Mexican physicians (38%) represented the most common respondents, respectively.

TABLE 2. Sites Ranked by MTV

Sites	MTV[a] Score
H&N cancer	4.11
CNS	4.93
Breast	5.28
Gynecologic	5.82
GI	5.92
SBRT	5.95
Lungs	6.2
Genitourinary	6.25
Pediatrics	8.53
Lymphoma	8.61
Brachytherapy	8.71
Sarcoma	9.56
Medical Physics	11.14

Abbreviations: H&N, head and neck; MTV, mean topic value; SBRT, stereotactic body radiotherapy.

[a]Lower scores indicate more interest.

DISCUSSION

With international collaboration and a large sample size, we present the first survey results detailing radiation oncology educational interests from Spanish-speaking Latin American countries, representing a vast geographic area of Latin America and wide-ranging career length in radiation oncology. Participants were overwhelmingly interested in a virtual platform to discuss cases and treatment advances (98%), and most were specifically interested in H&N cancer education, as this topic was the most popular selection for three out of the four experience groups. The most popular time for survey participants for a virtual education session was Friday after work.

We chose to survey oncologists in Spanish-speaking Latin America—which represents approximately 650 million people and 20 countries—not only because of our strong personal connections to the region but also because we recognize the lack of reporting for e-contouring and physician education interest in the region. A notable limitation of this selection was that the language focus on Spanish subsequently did not include Lusophonic or Francophonic countries such as Brazil and Haiti. A recent systematic review evaluated e-contouring learning, and no experiences from Latin America were identified or included.[4] The majority of publications in that review originated in the United States or Europe, which are developed nations with experiences that may not apply to Latin America given their differences in both resources and culture. This work establishes a foundation to fill that knowledge gap.

We designed this study with the intent to increase physician participation in contouring education in Spanish-speaking Latin America and to maximize the value of in-person and virtual educational offerings. In-person e-contouring workshops have previously been held in Latin America as a teaching opportunity for contouring. To validate such work, we previously sought to demonstrate teaching effectiveness through pre- and postworkshop assessments.

Our experience was that postworkshop assessment completion rates were low, especially compared with experiences in developed Western countries. Additionally, past in-person workshops have encountered obstacles such as loss of internet access and loss of electricity. Therefore, virtual learning provides an opportunity wherein learners can gain knowledge within their own optimal settings; this is of particular importance in the developing world, where learners can choose the location that has the best internet access and electricity. To maximize future learning opportunities, we sought to establish what topics were of most interest to learners. We hope that by identifying the topics of most interest, we will increase not only attendance but also the rate of postworkshop assessments so we can evaluate the success of the workshop and plan for future educational work.

Inaccurate contouring is known to affect oncologic outcomes. In the Radiation Therapy Oncology Group 9704 trial, which evaluated the addition of radiotherapy to patients with pancreatic cancer, poor contouring was associated with inferior survival.[7] Similar evidence was observed from clinical trials evaluating radiotherapy protocol compliance in advanced H&N cancer and in a corroborating meta-analysis demonstrating radiotherapy deviations and inferior clinical outcomes.[8,9] Importantly, the fact that survey respondents answered H&N cancer most commonly is corroborated by the experience of an English-based virtual contouring platform for which H&N cancer was the cancer site most frequently visited.[10] These findings and ours suggest that site selection may be driven by the nuances of cancer spread and the anatomic knowledge required by practitioners to deliver contour-based treatment and the known association between protocol deviation and oncologic outcome.

This work is limited in a few ways. Owing to our snowball sampling method of survey distribution per our IRB-approved protocol, leaders within the country and in the region were identified to disseminate the survey. As such, the denominator of respondents and subsequent response rate are incalculable to be exact, but we estimate that at least approximately 980 surveys were completed, estimating a complete response rate as high as 14%. Although surveys were distributed in Spanish, Spanish is not the official language of some Latin American countries, such as Brazil and Haiti. Similarly, although many nations of Spanish-speaking Latin America are represented, there was a paucity of response from Central America with no responses from oncologists in Guatemala, Honduras, Nicaragua, Costa Rica, and Panama. The response pattern and make-up of respondents reflect our snowball sampling methodology, which can create selection bias. Our survey did not attempt to self-diagnose obstacles or barriers that could lead to low completion rates, such as issues with internet connectivity; subsequent investigations should directly explore such factors that may hinder completion. Additionally, the survey we designed was novel, and although our design required consensus from our investigators (with team members D.D.L.M., A.P., S.S., and G.S. as members of the population surveyed), we did not conduct pilot testing in a small sample apart from review by our own scientific team. Future efforts targeting Latin America should consider the needs of French, Haitian Creole, and Portuguese-speaking practitioners. Similarly, future efforts should expand on improving representation and outreach to Central American radiation oncologists.

Using the data we gathered, we prepared a virtual Spanish-language educational session focusing on H&N cancer, delivered on January 31, 2020. We used Chartrounds Latinoamérica[11] as our virtual platform, managed by P.H. After our group reviewed the data, we selected H&N cancer expert D.J.S. to select cases for our H&N cancer workshop, a session translated by R.B.M.V. This event represented the first Chartrounds Latinoamérica session dedicated to H&N cancer teaching. A more recent June 19, 2020, Chartrounds Latinoamérica session led by D.D.L.M. taking place on a Friday after work, which was the most popular time among our respondents, included more than 100 participants. We plan to use our collected data to similarly optimize the content of future sessions to match attendee interest per survey results.

The evolution of radiotherapy technology in Latin America was rapid: Whereas the transition from 2D to 3D to IMRT in countries such as the United States took place over 15 years, in some Latin American countries, the transition occurred in a span of 3-4 years. Significant heterogeneity in available technology exists; with this gap in radiation oncology technology capacity and rising cancer incidence, there is demand for more modern radiotherapy facilities and properly educated healthcare professionals.[12,13] Understandably, physicians must adapt to the technology available. Our work represents the first report of topics of interest to Spanish-speaking Latin American radiation oncologists of all career levels. Future directions seek to focus on virtual case presentations with particular emphasis on H&N cancers and CNS cancers and to engage Latin American physicians by delivering content on these self-reported topics of interest. We aim to improve assessment completion rates to better evaluate the efficacy of remote e-contouring sessions within Latin America.

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AUTHORS' DISCLOSURES OF POTENTIAL CONFLICTS OF INTEREST

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