



Disseminating a Pediatric Oncology Critical Care Intervention in Latin America and Spain: An Integrated-Knowledge-Translation Approach

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Received: 4 September 2025 / Accepted: 23 February 2026 / Published online: 12 March 2026
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Abstract

PROACTIVE (Pediatric Oncology Capacity Assessment Tool for Intensive Care) is a quality improvement (QI) intervention that assist pediatric onco-critical care teams identify institutional strengths and gaps, but language barriers have limited its global uptake. This study aimed to evaluate the translation, refinement, and dissemination of Spanish-PROACTIVE guided by an integrated knowledge translation (IKT) approach. We conducted a four-phase mixed-methods study including: (1) translating and piloting Spanish-PROACTIVE in 22 centers across 12 countries in Latin America and Spain, (2) identifying institutional and regional pediatric onco-critical care challenges and QI priorities, (3) assessing barriers to disseminating results, and (4) co-developing dissemination tools. The professionally translated and refined Spanish-PROACTIVE identified key institutional and common regional pediatric onco-critical care challenges including lack of multidisciplinary rounds (only 14% availability). Institutional barriers to disseminating results included limited time and resources, gaps in dissemination knowledge and skill, and lack of mentorship. These findings informed the co-development of tailored dissemination tools, including a leadership-focused slide deck and a clinical-staff-targeted infographic to support internal dissemination. Applying an IKT approach effectively addressed language and dissemination barriers, and improved accessibility and local relevance of PROACTIVE. Spanish-PROACTIVE supports consistent multilingual data collection, and its contextually tailored dissemination tools may enhance internal communication and uptake of findings across Spanish-speaking institutions. This approach offers a practical model for strengthening dissemination and accelerating uptake of intervention results in linguistically diverse, resource-constrained settings, supporting global efforts to improve outcomes for children with cancer.

Keywords Integrated knowledge translation · Quality improvement · Pediatric oncology critical care · Global health

Each year, approximately 400,000 children worldwide receive a cancer diagnosis, with nearly 90% of cases occurring in low- and middle-income countries (Bhakta et al., 2019; Ward et al., 2019). Children with cancer are at high risk of acute critical illness, with as many as 40% requiring at least one admission to a pediatric intensive care unit

during cancer-directed therapy (Wösten-van Asperen et al., 2019; Zinter et al., 2014). Limited access to high-quality pediatric onco-critical care in these settings contributes to disproportionately high mortality rates (Ehrlich et al., 2023), with pooled pediatric intensive care unit mortality reaching 30.3% (Gabela et al., 2024). These disparities underscore

the urgent need for context-specific tools that help institutions evaluate their pediatric onco-critical care capacity, identify gaps, and initiate targeted improvements initiatives.

To help address this gap, the St. Jude Children's Research Hospital (St. Jude) Global Critical Care Program (St. Jude Global – Transversal Critical Care Program [GCCP], 2025) launched the Pediatric Oncology Capacity Assessment Tool for Intensive Care (PROACTIVE) in 2021. PROACTIVE is a structured, multicomponent, quality improvement (QI) intervention designed to support institutions in evaluating and strengthening their pediatric onco-critical care services (Abutineh et al., 2023; Arias et al., 2020, 2023; GCCP, 2025; Torres et al., 2025). It consists of three components: (1) a standardized assessment tool that systematically evaluates existing pediatric onco-critical care capacity and quality of care; (2) a comprehensive, site-specific report that highlights key areas for improvement, and (3) an educational QI workshop that equips clinical teams to identify local challenges, set priorities, and develop actionable strategies. Together, these components provide healthcare professionals with practical information to guide institutional planning, resource allocation, and quality improvement efforts – contributions that are especially valuable in resource-limited settings.

Between January 2021 and May 2022, 29 hospitals across 19 countries completed the PROACTIVE process in English. Eleven centers were located in Latin America and Spain, where many healthcare providers faced substantial language-related challenges in understanding, applying, and disseminating their PROACTIVE results within their institutions. Although PROACTIVE has a strong potential to improve pediatric cancer care and outcomes globally, its availability only in English limits accessibility, reduces accuracy of data collection, and impedes institutional uptake of findings in linguistically diverse regions.

Effective dissemination, defined as the intentional process of spreading interventions, programs, or research findings to intended users, is essential for translating results into practices and improving public health decision-making (Baumann et al., 2022). Yet guidance on how to effectively disseminate interventions, such as PROACTIVE, remains a challenge, especially in linguistically diverse, resource-constrained settings (Brownson et al., 2018). Several challenges, including limited resources and funding, inadequate capacity to effectively communicate research findings, and unclear roles and responsibilities during dissemination (Tabak et al., 2014), underscore the needs for strategies that integrate language adaptation with structured, contextually grounded dissemination planning.

The integrated knowledge translation (IKT) framework offers such an approach. IKT emphasizes co-production of knowledge by engaging “knowledge-users” or frontline

clinicians, nurses, and health administrators, as active and equal partners in shaping research questions, methods, tools, data collection, interpretation of findings, and dissemination and implementation plans (Graham & Tetroe., 2007; Leggat et al., 2023; Nguyen et al., 2020). This framework is particularly well suited for multilingual, resource-limited contexts because it promotes shared decision-making, contextual adaptation, and continuous feedback – elements that increase the relevance, usability, and local uptake of findings. Prior studies show that IKT can strengthen dissemination efforts in other clinical areas, such as in spinal cord injury research (Shwed et al., 2023). However, no prior studies have examined how combining language adaptation with a structured dissemination strategy, guided by an IKT framework, influences uptake of tools like PROACTIVE in Spanish-speaking regions.

The aim of this study was to evaluate the translation, refinement, and dissemination of PROACTIVE across Spanish-speaking centers guided by an IKT approach. We hypothesized that employing an IKT approach would enhance PROACTIVE's accessibility, improve data collection accuracy, and strengthen institutions' ability to disseminate and act on their results to improve outcomes for critically ill children with cancer. To achieve this objective, we translated the tool into Spanish (hereafter referred to as Spanish-PROACTIVE) and pilot-tested the assessment tool, site-specific report, and QI workshop training materials with local knowledge-users; analyzed pilot results to identify site-level gaps, common regional challenges in pediatric onco-critical care services, and shared QI priorities; explored institutional barriers to disseminating Spanish-PROACTIVE results internally; and co-developed contextually relevant, language-appropriate tools to support local dissemination, data use and promote institutional uptake of findings.

Methods

This study follows a four-phase mixed-methods design informed by IKT principles (Nguyen et al., 2020). Each phase (outlined below and in Fig. 1) was designed to achieve a specific objective contributing to the overarching goals of improving access to Spanish-PROACTIVE across Latin America and Spain and strengthening local dissemination of its results at participating institutions. The study was reviewed and approved by the St. Jude Institutional Review Board as an exempt QI study.

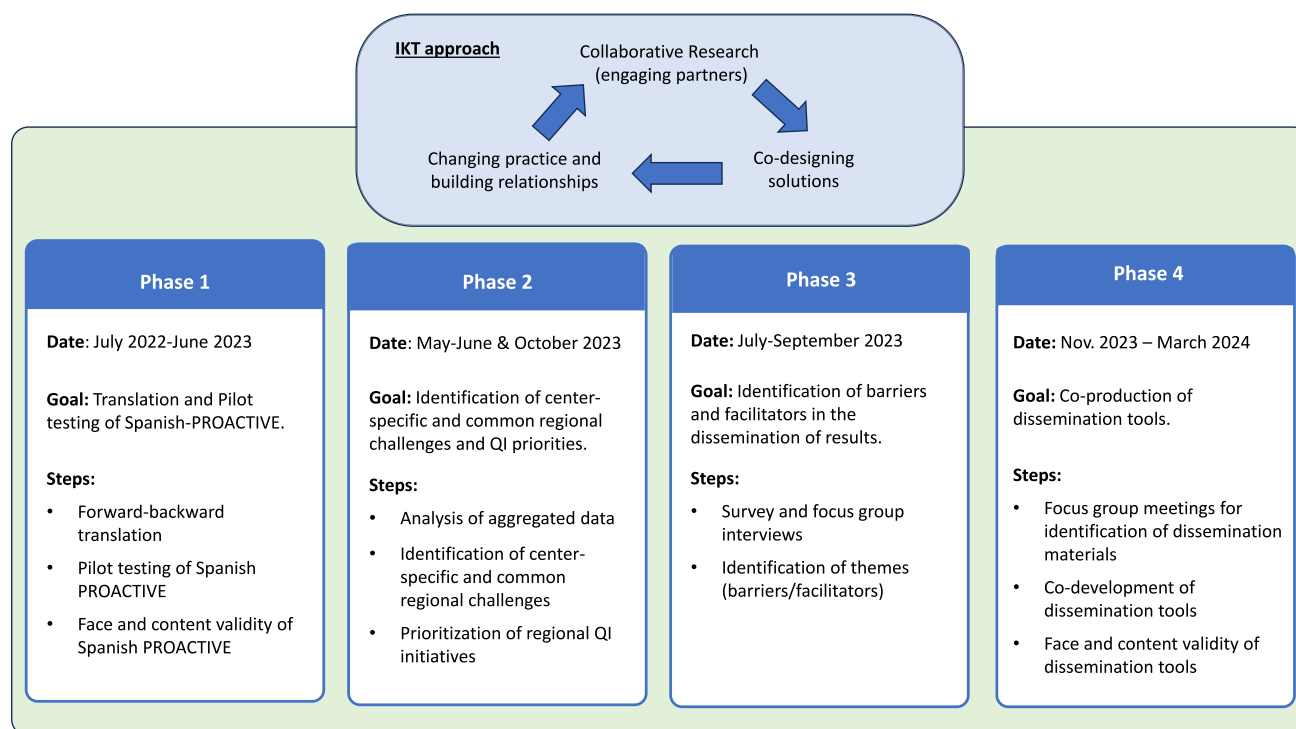


Fig. 1 Study design. The four mixed-method phases of the study are outlined. Each phase was designed to facilitate the refinement, implementation, and dissemination of Spanish-PROACTIVE using an integrated knowledge translation approach

Overview of PROACTIVE

PROACTIVE is a multicomponent QI intervention designed to strengthen pediatric onco-critical care services. It consists of three core components: 1) an *assessment tool* with 119 indicators related to pediatric onco-critical care capacity and quality (Arias et al., 2020), organized into 200 electronically REDCap (Research Electronic Data Capture) questions that are administered in a mentored, stepwise manner over 15 weeks (Arias et al., 2023); 2) a *site-specific report* summarizing institutional strengths and areas for improvement (Arias et al., 2023); and 3) a *virtual QI workshop* that combines lectures and small-group activities to equip multidisciplinary teams with foundational QI skills, support the identification of local challenges, and facilitate the initiation of context-specific QI projects (GCCP, 2025).

Pilot Sites and Knowledge-Users

Sites from Latin America and Spain were recruited through established partnerships within the St. Jude Global Alliance (St. Jude Global, 2025) and the Global Critical Care Program (2025) networks to pilot Spanish-PROACTIVE and ensure broad regional representation. These sites routinely collaborate on capacity-building initiatives, thereby ensuring engagement from centers committed to improving

pediatric onco-critical care. We included both primary and secondary knowledge-users to capture diverse perspectives across clinical roles and hierarchical levels. *Primary knowledge-user* (site leaders overseeing the execution of Spanish-PROACTIVE) were invited via email to participate in all study phases. These collaborators (EL-B, CA, RA, YA, EB-A, RC, MEC, CLG, AE-L, LF-C, DG-B, JG-C, MG-P, REL-P, RL-P, NAL-F, MM-R, SM, RM, RP-M, EP-U, MS-M, SFT, MT-B) actively contributed to refining Spanish-PROACTIVE, participated in data collection and interpretation, and co-developed dissemination tools. They, in turn, invited five additional Spanish-speaking clinicians (nurses and physicians directly involved in pediatric onco-critical care) to be *secondary knowledge-users* (YA-J, JB, AC, MC, CG) and contribute to prioritization exercises (i.e., phase 2) and development of dissemination tools (phase 4), thereby aligning with IKT principles to emphasize inclusivity and co-production.

Surveys and Focus Groups Conducted during Phases 1–4

During each phase, knowledge-users had the option to complete an online survey, participate in focus group discussions, or both. Surveys were administered in Spanish by using Microsoft Forms (Microsoft forms, 2023) and included a

mix of multiple-choice and open-ended questions. Each survey remained open for 2 to 3 weeks. Focus groups were conducted in Spanish via Zoom Videoconferencing (Zoom videoconferencing, 2023) and were facilitated by two bilingual team members (ZD and MP-T) who were not previously involved in PROACTIVE and were not previously known to knowledge-users. Each session lasted approximately 60 min, were audio-recorded, and transcribed using a nonverbatim approach that captured key ideas and themes (Hill et al., 2022). A bilingual senior researcher (AVA) independently reviewed all survey responses and transcripts to ensure data accuracy and quality.

Phase 1 – Translation and Pilot Testing of Spanish-PROACTIVE

In July 2022, the original English version of PROACTIVE was translated into Spanish by an independent professional translation service. A forward–backward translation method was used to ensure linguistic accuracy and conceptual and cultural equivalence of medical terminology across diverse Spanish-speaking settings (Thammaiah et al., 2016; Toma et al., 2017), an essential requirement for tools applied across multiple countries. In this process, the PROACTIVE components were first translated into Spanish by the translation service and then independently translated back into English by two bilingual clinicians (AVA, EL-B) from Chile and Colombia, respectively. This step helped to refine the translations, resolve discrepancies, and ensure fidelity to the original content.

Pilot testing of Spanish-PROACTIVE was conducted from January to June 2023 across 22 sites across Latin America and Spain. Participating hospitals assembled Spanish-speaking multidisciplinary teams of physicians and nurses providing care to critically ill pediatric hematology-oncology patients. These teams assessed their local pediatric onco-critical care services over a 15-week period, reviewed their site-specific reports, and completed the online QI workshop, which was conducted in Spanish.

From May to June 2023, primary knowledge-users refined the Spanish-PROACTIVE components and provided feedback through a survey and three online focus groups (Appendix 1), assessing clarity, comprehensibility, face, and content validity. Their feedback informed final revisions to all Spanish-PROACTIVE components.

Phase 2 – Identification of Center-Specific Gaps, Common Regional Challenges, and QI Priorities

PROACTIVE collects a range of data through dichotomous, numerical, and Likert-scale items. Each indicator is scored on a scale from 0 to 5, with 5 representing optimal

performance or 100% availability of a resource, and 0 representing absence or poor performance (Arias et al., 2023). Aggregated data from the pilot sites, collected via REDCap, were analyzed to identify center-specific gaps and common challenges in pediatric onco-critical care. Indicators with a median score of less than 50% for availability or performance across participating sites were categorized as “common challenges.” These results informed prioritization exercises completed with primary and secondary knowledge-users in October 2023.

We used an impact-effort matrix for these prioritization exercises because it is a structured and practical decision-making tool that help teams prioritize feasible, high-impact QI opportunities (Alfieri et al., 2023; Global Sigma Six, 2024), particularly in resource-limited settings. Using this matrix and facilitated through the Mural visual collaboration platform (Luma Institute, 2022), knowledge-users collaboratively identified regional QI priorities. The primary goal of these sessions was to strengthen participants’ capacity to strategically interpret their Spanish-PROACTIVE results and identify achievable QI priorities.

Phase 3 – Assessment of Local Barriers to Disseminating Spanish-PROACTIVE Results

In July 2023, primary knowledge-users completed an online survey (Appendix 2) to identify institutional barriers and facilitators to disseminating Spanish-PROACTIVE results. Primary knowledge-users were also asked, if applicable, whether they had shared their site-specific reports (Appendix 3) and whether sharing had led to any changes in clinical practices or QI initiatives. Survey analysis followed a combined deductive-inductive qualitative approach: initial coding used a priori categories drawn from the literature (Abu-Odah et al., 2022; Hu et al., 2023; McElfish et al., 2019; Melvin, 2020), and emergent themes were incorporated iteratively. Two researchers (ZD and AVA) coded all qualitative data independently, compared outputs, and resolved discrepancies through discussion, refining the framework as needed.

To further explore these findings and gather real-world examples, we conducted two follow-up focus group interviews in September 2023. Synthesized survey themes were presented as part of a member-checking process (Mckim, 2023), thereby allowing primary knowledge-users to clarify, elaborate, and ensure contextual accuracy and relevance of the results.

Phase 4 – Co-development of Tools for Local Dissemination of Spanish-PROACTIVE Results

Between November 2023 and March 2024, four interactive workshops were held with primary and secondary knowledge-users to design tools for disseminating Spanish-PROACTIVE results to target audiences at their institutions. Using the Mural visual collaboration platform (Luma Institute, 2022), participants brainstormed, prioritized ideas, and collaboratively designed dissemination tools tailored to their local contexts (Appendix 4).

During these sessions, knowledge-users identified the most feasible and relevant dissemination materials to co-produce, defined the core message to be communicated, and specified target audiences (e.g., pediatric intensive care unit teams, hospital leadership). A final focus group held in March 2024 gathered feedback on the drafted tools to refine their clarity and usability (Appendix 5).

Results

Overview of Findings across All Four Phases

This four-phase mixed-methods study generated insights that informed the refinement, implementation, interpretation, and dissemination of Spanish-PROACTIVE across Latin America and Spain. *Phase 1* produced targeted

linguistic adjustments to enhance conceptual and cultural equivalence across Spanish-speaking settings. *Phase 2* enabled the identification of center-specific gaps and common regional challenges, while also establishing shared QI priorities across institutions. *Phase 3* highlighted system-level, knowledge-based, and skill-related barriers that limited institutions' ability to effectively disseminate and act on their PROACTIVE results. Finally, *Phase 4* resulted in the co-development of practical dissemination tools—tailored to hospital leadership and frontline clinical teams.

Phase 1 – Translation and Pilot Testing of Spanish-PROACTIVE

Spanish-PROACTIVE underwent linguistic refinement based on forward–backward translation and user feedback, ensuring that medical terminology was used consistently and clearly across diverse Spanish-speaking regions. We piloted Spanish-PROACTIVE in 22 centers across 12 countries (Fig. 2, Appendix 6) from January to June 2023. Twenty-four primary knowledge-users (Table 1) provided feedback on all Spanish-PROACTIVE components through an online survey and three focus groups (4–10 users per group). Revisions to the assessment tool focused on refining five terms to standardize language (e.g., replacing “residents” and “fellows” – roles not present in all hospitals – with “physicians in training”, revising “consultants” to “physician

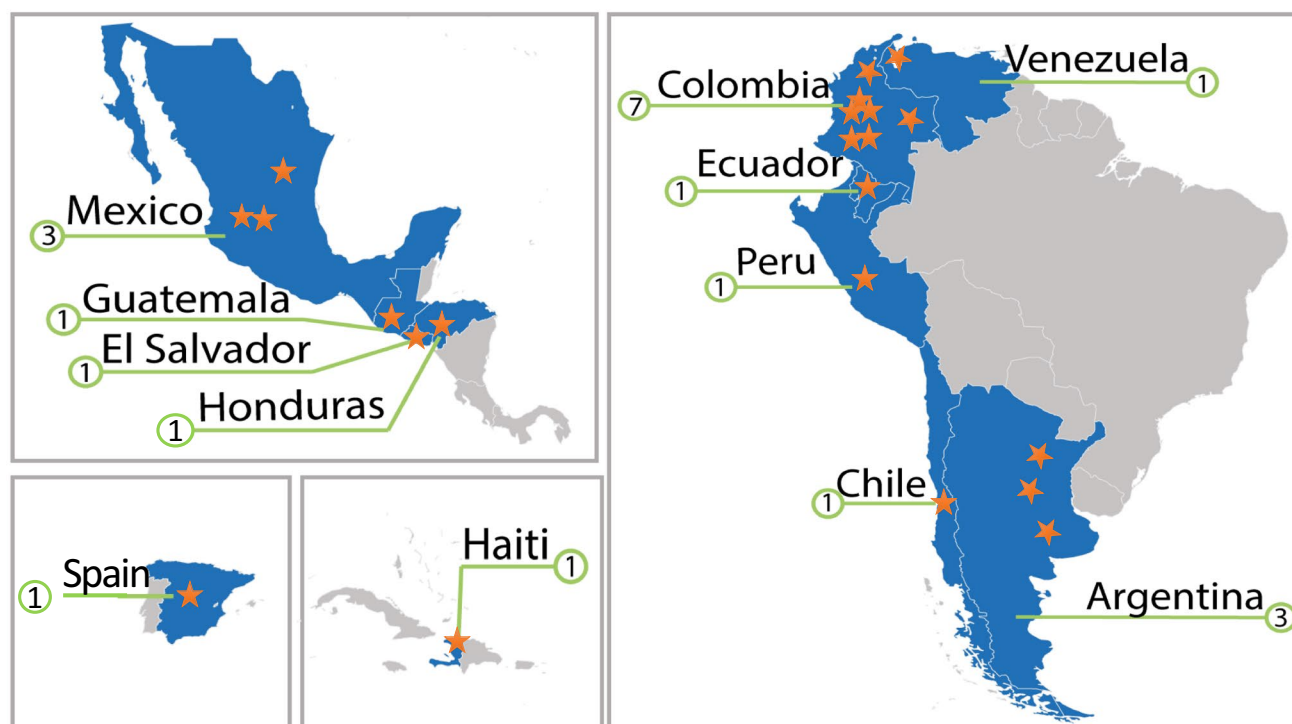


Fig. 2 Participating centers. Map showing the locations of the 22 participating centers in Latin America and Spain

Table 1 Characteristics of primary and secondary knowledge-users

Characteristic	Knowledge-users* n (%)
Sex	
Female	19 (66)
Male	10 (34)
Years in practice	
≤ 5	6 (20)
6–10	7 (24)
11–19	8 (28)
≥ 20	8 (28)
Profession	
Pediatric intensivist	13 (45)
Pediatric hematology-oncologist	11 (38)
Pediatrician	3 (10)
Nurse	2 (7)
Country Income Level†	
High	2 (17)
Upper-middle	6 (50)
Low to middle	3 (25)
Not classified	1 (8)

*This group included 24 primary knowledge-users and 5 secondary knowledge-users

†Incomes of 12 countries in this study were determined based on the World Bank classification for fiscal year 2023 (World Bank Country Classification, 2023). High-income countries are noted as those with a gross national income per capital (GNI) ≥ \$13,205 (US); upper-middle income countries were those with a GNI of \$4,256–\$13,620 (US); low- to middle-income countries are those with a GNI of \$1,086–\$4,255 (US); low-income countries are those with a GNI ≤ \$1,085 (US)

consultants”, “pediatric critical care physician” to “pediatric intensivist”, and “intermediate care unit” to “intermediate care unit/high-dependency unit”). Two definitions were added to clarify concepts that had been interpreted inconsistently (e.g., “close unit” and “healthcare workers”), and one item related to cause of death reporting (e.g., “death due to sepsis” to “primary cause of death due to sepsis”) (Appendix 7). No revisions were requested for the QI training materials, which primary knowledge-users described as clear, relevant, and appropriate.

Phase 2 – Identification of Center-Specific Gaps, Common Regional Challenges, and QI Priorities

Analysis of site-level and aggregated Spanish-PROACTIVE data from pilot sites across eight domains and 22 sub-domains (Appendix 8), enabled a comprehensive review of system-level capacity and variability in performance. This analysis identified both institutional strengths and limitations in pediatric onco-critical care services across Spanish-speaking centers. The most common challenges across

Table 2 Most common challenges in pediatric oncology critical care services in Latin America and Spain identified by Spanish-PROACTIVE

Domain	Indicator	Availability < 50% No. sites (%) [*]
Personnel	In-house pediatric intensivists 24 h/7 days/week	9 (41)
Service capacity	System to transfer deteriorating patients to the PICU in < 1 h	4 (18)
Service integration	Daily multidisciplinary rounds with parents/families	3 (14)
	System to monitor abstinence and withdrawal symptoms	10 (45)
	System to track deep venous thrombosis	9 (41)
Supportive services	System to obtain emergent laboratory results within 1 h	7 (32)

*N=22 sites, PICU Pediatric intensive care unit

institutions included: 1) the absence of monitoring for abstinence and withdrawal symptoms; 2) a shortage of fellowship-trained pediatric intensivists, leading to an inability to provide continuous (24-h/7 days/week) coverage; 3) the lack of a formal system to track deep venous thrombosis cases; 4) the inability to transfer critically ill patients to the pediatric intensive care unit within 1 h of clinical deterioration; 5) delays in obtaining emergent laboratory results within 1 h of ordering; and 6) the lack of structured multidisciplinary rounds that includes active participation of parents. These findings closely mirror challenges identified in prior English-language PROACTIVE implementation (Abutineh et al., 2023; Arias et al., 2023), suggesting that several systemic gaps transcend language and underscoring the need for regionally tailored QI strategies.

These findings (Table 2) guided two prioritization exercise sessions with 22 of 29 knowledge-users (Table 1). Through this collaborative process – using the impact–effort matrix decision-making tool – implementation of multidisciplinary rounds with family participation emerged as the most feasible, high-impact regional QI priority for Latin America and Spain (Shared priority exercise in Appendix 9).

Phase 3—Assessment of Local Barriers to Disseminating Spanish-PROACTIVE Results

We collected the perceptions of barriers and facilitators related to disseminating Spanish-PROACTIVE results within institutions from all 24 primary knowledge-users through an online survey, two follow-up focus group interviews, or both. Thematic analysis of survey responses initially identified eight themes based on the existing literature. During the focus group discussions, knowledge-users

contributed three additional topics, resulting in a total of 11 distinct themes.

Facilitators of dissemination included 1) knowledge-transfer or ability to share the information via their site-specific reports; 2) collaboration with team members to share results with other clinicians; and 3) capacity-building through the sharing of institutional results, enabling teams to act on findings and establish themselves as local QI experts. During focus groups, two additional facilitators emerged: 4) accessibility of Spanish-PROACTIVE and 5) institutional leadership buy-in. These were categorized into two overarching domains: methods and benefits (Table 3 and Appendix 10). Importantly, access to all three PROACTIVE components in Spanish was consistently mentioned as a key enabler for accurate data collection; broader participation, particularly among monolingual Spanish-speaking team members; and fostering a more supportive and inclusive process for the evaluation of pediatric onco-critical care services, ultimately empowering teams to act on their results.

The majority (88%) of primary knowledge-users acknowledged the importance of local dissemination to communicate and act on their results. However, only 33% (8/24) reported using their site-specific reports to prioritize and initiate QI projects, thereby highlighting a gap between data acquisition and actionable implementation. We grouped the barriers to dissemination into two distinct categories: system-level and knowledge-based barriers. System-level barriers included: 1) time constraints, particularly for group discussions of Spanish-PROACTIVE results; 2) difficulties engaging nursing staff in dissemination activities; and 3) inadequate resources, specifically the lack of dissemination materials and institutional support to facilitate knowledge-sharing. Knowledge-based barriers included: 1) knowledge gaps or limited awareness of dissemination concept, reflected in uncertainty about which results to share with different audiences; and 2) limited skills or difficulties applying dissemination concepts to effectively present data or translate findings into prioritized QI interventions. Knowledge-users also identified a third barrier during focus groups—the lack of mentorship, particularly the absence of experienced local leaders to guide dissemination effort and support interpretation and use of results (Table 3). Together, these barriers provide a deeper understanding of the institutional challenges affecting local dissemination and application of Spanish-PROACTIVE findings.

Table 3 Facilitators of and barriers to the dissemination of Spanish-PROACTIVE findings

Domains	Categories	Themes
Facilitators	Method	Accessibility in Spanish (language adaptation)
	Benefits	Knowledge-transfer (sharing of results via reports) Collaboration (teamwork) Leadership buy-in (reducing resistance and empowering engagement in the intervention) Capacity building (strengthening of knowledge and skills in QI)
Barriers	System-level	Time constraints (competing responsibilities) Workforce engagement Inadequate support/resources for dissemination
	Knowledge-based	Lack of knowledge on how to communicate results Lack of skills on how to use results and establish priorities Lack of mentorship to successfully disseminate results

QI Quality improvement

Phase 4 –Co-development of Materials to Support the Local Dissemination of Spanish-PROACTIVE Results

During this phase, all 29 knowledge-users participated in at least one of four workshop sessions designed to identify, design, and develop dissemination tools for sharing Spanish-PROACTIVE results within their institutions. More than 80% of knowledge-users agreed that the most feasible and high-impact dissemination tools were a leadership-focused PowerPoint slide-deck and a clinical-staff-targeted pamphlet/infographic to support internal dissemination of results.

We identified the primary target audiences for these dissemination tools as: members of the Spanish-PROACTIVE team beyond the designated site lead(s); hospital leadership, including Intensive Care Unit medical directors and administrators; and broader clinical staff working in critical care settings, such as Pediatric Intensive Care Units or High-Dependency Units. Both dissemination tools convey a core message emphasizing Spanish-PROACTIVE's goals, a summary of site-specific findings, and opportunities for hospital-level QI. They incorporated visually oriented content such as color-coded performance summaries across PROACTIVE domains, simple tables highlighting strengths and gaps, and one-slide summary of potential QI opportunities.

The slide deck provided detailed quantitative results to support institutional decision-making for hospital leadership and Spanish-PROACTIVE teams, whereas the pamphlet offered a concise, visually engaging overview for frontline clinical staff (Appendix 11). Throughout the co-development process, knowledge-users offered iterative feedback on the content and visual design (Appendix 12). Revisions included adding QR codes in the pamphlet linking directly to PROACTIVE publications and resources, improving font size to enhance readability, and incorporating new slides in the presentation to show multiyear progress for institutions that had previously completed PROACTIVE.

Early Dissemination Experiences

In follow up discussions, 71% (17/24) of primary knowledge-users reported having shared their Spanish-PROACTIVE results with hospital leadership or clinical staff at least once. Among the eight primary knowledge-users who met more than three times, common strategies for effective dissemination included engaging stakeholders (e.g., hospital leadership, nurses) early in the evaluation process, holding regular team and leadership meetings to review results and progress, and applying QI frameworks, such as the impact–effort matrix, to prioritize evidence-based interventions. They also emphasized the importance of timing, noting that using the dissemination tools immediately after completing Spanish-PROACTIVE helped maintain institutional momentum and facilitated alignment of results with existing institutional priorities.

Discussion

Dissemination research seeks to actively spread evidence-based interventions through the targeted distribution of information and intervention materials to specific audiences (AHRQ, 2019; Burnham et al., 2020). Despite growing recognition of its importance, the field remains underdeveloped, partly due to inconsistent conceptualization and limited empirical evidence (Baumann et al., 2022). Our work addresses this gap by examining the dissemination of an assessment tool, PROACTIVE, and its results to hospital leadership and clinical staff – an area with minimal prior research despite its importance for institutional, data-driven decision-making. To our knowledge, this work represents one of the first structured applications of an IKT-guided dissemination strategy for a pediatric onco-critical care assessment tool across Spanish-speaking low- and middle-income countries.

Although having PROACTIVE culturally and linguistically adapted to Spanish was an important first step and a facilitator for knowledge transfer (Benlidayi & Gupta, 2024; Cruchinho et al., 2024)—enabling teams to include non-English-speaking members in data collection, interpretation, and discussion of performance gaps in pediatric onco-critical care services—only 33% of knowledge users reported using their results to initiate or prioritize QI initiatives. This underscores a persistent gap between data generation and data use, a challenge frequently noted in dissemination literature, where absence of structured dissemination processes limits impact (Baumann et al., 2022).

Our findings highlight that translation alone is insufficient. Knowledge-users identified system-level barriers (e.g., time constraints, limited clinical staff engagement, lack of institutional dissemination resources) as well as knowledge-based barriers (e.g., limited familiarity with dissemination concepts and limited skills to apply them), aligning with prior literature (Abu-Odah et al., 2022; Hu et al., 2023; McElfish et al., 2019; Melvin, 2020). In response, we co-developed two practical dissemination tools – a leadership-oriented slide deck and a clinical-staff focused pamphlet/infographic – designed to be visually engaging, easy to share and adaptable to institutional needs. As Dixon-Woods and colleagues (2012) observed, "Improvement teams that try to cram the planning of a complex intervention involving multiple processes and people stakeholders into a few briefs, impromptu meetings held between clinical commitments will struggle to make an impact." These tools aim to prevent such pitfalls by providing a structured foundation for ongoing team discussions, interpretation, and stakeholder engagement.

To further bridge the gap between results and action, we identified common pediatric onco-critical care challenges across sites and integrated an impact–effort matrix prioritization exercise (Alfieri et al., 2023; Global Six Sigma, 2024) to help teams interpret results and identify feasible QI opportunities. Implementation of multidisciplinary rounds with families' participation emerged as the top regional QI priority, aligning with global efforts to strengthen communication, teamwork, and family-center care in critical care settings (St. Jude Global, 2025). This prioritization tool is now integrated into the PROACTIVE QI training curriculum to strengthen teams' decision-making capacity.

Practical and policy implications of our findings extend beyond individual institutions. First, our dissemination tools may support institutional strengthening by standardizing how results are communicated to leadership and frontline staff, reducing ambiguity, and promoting shared understanding of priorities. Second, at the regional level, these tools may contribute to harmonization of pediatric onco-critical care standards across Spanish-speaking low

and middle-income countries by enabling consistent communication of needs, gaps, and opportunities for regional QI initiatives. Third our findings highlight the need for structure mentorship networks, peer-support communities, and regional champions who can guide teams in interpreting PROACTIVE results and integrating them into local QI strategies – approaches that have effective in other global pediatric oncology initiatives (Agulnik et al., 2022a, 2022b; Godfrey et al., 2014; Gonzalez et al., 2021).

Based on these findings, we recommend that clinicians, program leaders, and researchers seeking to reduce dissemination barriers for interventions like Spanish-PROACTIVE: 1) Engage diverse stakeholders early in the assessment process, including nurses and hospital leadership, 2) Establish routine, structured meetings to review results, ensuring shared understanding and accountability, 3) Use simple, standardized dissemination tools to communicate finding across audiences, 4) Integrate prioritization frameworks such as the impact-effort matrix to identify feasible, high impact QI opportunities, 5) Develop local and regional mentorship networks to guide dissemination and QI planning and 6) invest in capacity-building initiatives that strengthen data interpretation, communication skills, and leadership engagement.

This study has limitations. First, knowledge-users were actively engaged in PROACTIVE and may not have been entirely objective, potentially overestimating the perceived value of disseminating Spanish-PROACTIVE results. Second, although we selected the pilot sites and knowledge-users to represent the intended user base for Spanish-PROACTIVE, our findings may not be generalizable to other regions with different healthcare structures. Third, the common regional pediatric onco-critical care challenges and institutional dissemination barriers that we identified reflect a cross-sectional snapshot that may evolve over time. Finally, while early feedback regarding dissemination tools was positive, their long-term effectiveness remains to be determined.

Next steps include evaluating the effectiveness of dissemination tools in promoting QI implementation, expanding PROACTIVE access to additional regions and languages, and developing regional mentorship and peer-support models (e.g., regional/local champions, regular virtual mentoring sessions) to sustain dissemination and support PROACTIVE scale-up efforts.

Conclusion

This study evaluated the translation, refinement, and dissemination of Spanish-PROACTIVE using an IKT approach through a four-phase, mixed-methods process.

Spanish-PROACTIVE was successfully adapted and consistently identified institutional and regional gaps. Importantly, findings demonstrate that translation alone is insufficient to ensure use of PROACTIVE results. By systematically identifying dissemination barriers and co-developing tailored, audience-specific dissemination tools, this work enhanced accessibility, relevance, and internal communication of PROACTIVE results.

Overall, this integrated approach offers a scalable and replicable framework for linguistically diverse and resource-constrained settings, strengthening dissemination processes, accelerating the use of quality improvement data, and supporting pediatric onco-critical care teams in translating their results into action, with the potential to improve outcomes for children with cancer globally. Future efforts will focus on structured mentorship, integration of prioritization tools, dissemination training, and evaluation of dissemination outcomes to sustain benefits of Spanish-PROACTIVE.

Supplementary Information The online version contains supplementary material available at <https://doi.org/10.1007/s43477-026-00218-5>.

Acknowledgements We thank all the Latin America and Spain PROACTIVE team members for their support during the pilot testing of the Spanish-PROACTIVE.

Author Contributions AVA and ZD led the conceptualization, conducted the formal analysis, and drafted the initial version of the manuscript. AA and SM provided overall guidance for this manuscript, contributed methodological expertise, and offered critical feedback on the drafts. EL-B, CA, RA, YA, YA-J, JB, EB-A, AC, MC, RC, MEC, CLG, AE-L, LF-C, DG-B; JG-C, MG-P, CG, REL-P; RL-P; NAL-F, MM-R, SM, RM, RP-M, EP-U, MS-M, SFT, and MT-B contributed to the study design, interpretation of the findings, and provided substantive feedback. AP-T, ML, PA-P, RB, YC, and JM supported software and technical components and contributed to data interpretation. AVA and AA were responsible for funding acquisition. All authors reviewed and approved the final submitted version of the manuscript and agree to be accountable for all aspects of the work.

Funding American Lebanese Syrian Associated Charities, NCI, R25CA023944

Data Availability All data generated and relevant to this work are included in the manuscript and supplementary materials.

Declarations

Competing Interests The authors declare no competing interests.

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