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Analysis of National Presentations of Surgical Case Series Discussions: What Matters to Surgeons?

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ABSTRACT

Background: Although the surgical case series is a useful study design for surgical disciplines, elements of its presentation have not been standardized with a widely accepted reporting guideline. Hence, case series may not include all components necessary for surgeons to best interpret their results. We aimed to determine core elements of case series through qualitative analysis of discussions after presentations at national meetings.

Methods: Case series with accompanying discussions in three high-impact journals from 2010 to 2015 were analyzed with conventional content analysis. All interrogative sentences were selected for analysis and were classified by a redundant iterative process into descriptive categories and subcategories.

Results: Two hundred twenty-one case series were identified, 56 of which included discussion transcripts. Four hundred seventy six unique interrogatives were classified into 4 categories and 13 subcategories. The main categories identified were "Application of Results to Patient Care," "Clarification of Study Methodology," "Facilitation of Author Insight," and "Request for Additional Study-Specific Data." The most frequent subcategories of inquiry pertained to the changes to current standard of care, clarification of study variables, and subgroup data and outcomes.

Conclusions: We determined major themes of inquiry that reflected core elements surgeons use to evaluate case series for relevance and applicability to their own practice. Discussants frequently questioned how the study's results changed the author's standard of care. Specifically encouraging surgical case series authors to comment on changes they made to their practice as a result of their findings would allow the surgical audience to quickly assess potential clinical applicability.

Introduction

In the established hierarchy of research study designs, the randomized controlled trial (RCT) is considered the gold standard study design for hypothesis testing.[1-4] Although RCTs reduce bias through randomization and control for potential confounding factors when testing the effect of a treatment, their execution has proven difficult for some areas of medicine.[5] Historically, there has been a dearth of surgical RCTs.[6-8] Multiple factors contribute to this deficit in surgery and weaken the internal validity of surgical RCTs: low case volume at individual centers, learning curve of new surgical

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techniques, difficulty with standardization of surgical procedures, changes in surgeon preferences over time, and limitations in surgeon blinding.[9-12] In addition, randomized testing of accepted gold standard surgical treatments against proposed alternative surgical measures generates ethical concerns.[13]

A case series is a descriptive study that samples groups of patients in an uncontrolled fashion.[14,15] In surgery, the case series is largely used by surgeons to report their experience with a particular surgical technique. Although the case series is lower in the hierarchy of clinical evidence, physicians—and surgeons in particular—recognize the value and importance of learning from collective clinical experience of experts in a real-world setting.[16] In addition, surgical case series are able to provide insights into the mechanism of disease, disease management, and complication management. As such, surgical case series continue to be quite commonly published across a variety of surgical fields. Although standardized guidelines for reporting RCTs have been in wide use since the release in 1996 of the Consolidated Standards of Reporting Trials guidelines,[17] the publication of surgical case series has been limited by a lack of standardized reporting guidelines. The recent development of the Surgical Case Report guideline for case reports and, more pointedly, the Preferred Reporting of Case Series in Surgery (PROCESS) guideline for case series may help improve reporting quality if more widely implemented.[18,19] At present, however, the presentation of case series is still quite varied and may not include information considered important to the surgeon audience.

We aimed to inductively determine which core elements surgeons deem important for evaluating the findings from surgical case series. To do this, we performed a qualitative analysis of the questions surgeon discussants asked after oral presentations of case series at national surgical meetings that were published in high-impact surgical journals.

Methods

Conventional content analysis and thematic analysis

All items listed in the table of contents of the online databases of three high-impact surgical journals—Annals of Surgery, Journal of the American College of Surgeons, and JAMA Surgery—were reviewed from January 2010 to April 2015 to identify case series. Because there are no established thresholds for case series sizes, and we particularly wanted to evaluate large case series, we arbitrarily decided to include any study of a consecutive series of at least 100 patients at a single or at most two centers for the purpose of describing their clinical outcomes.[15] All case series articles presented and published in the English language were selected. If there was uncertainty on whether an article was a case series by these definitions, it was reviewed in its entirety by two authors, A.S., an undergraduate student researcher, and E.W., MD, FACS, a surgical oncologist with qualitative research training during masters time and experience with Qualitative Research collaborative, and an agreement was reached on inclusion. All case series published with a transcript of surgeon inquiries after oral presentation of the article at national surgical meetings (i.e., postpresentation discussions) were selected for inclusion. Only articles with postpresentation discussions were included, and any case series published with invited commentary or invited critique that was not offered in person at the end of presentation were excluded to identify questions rather than a surgeon's perspective on the clinical problem alone.

Conventional content analysis with line-by-line coding was conducted of all interrogative statements in accordance with methods described in Hsieh's "Three Approaches to Qualitative Content Analysis".[20] Thematic analysis was conducted by a standard redundant iterative process.[21-23] Interrogative statements were jointly examined by two authors (A.S. and E.W.) and were closely examined within the contexts of the full discussant comments and the article itself. Statements by the same discussant that proposed one thought using multiple questions (e.g., asking a question followed by a second question rephrasing the same idea using different wording) were condensed and counted as a single thought. Thematic analysis was performed on all interrogative statements to classify them into descriptive categories and subcategories. If a question contained multiple thoughts that fit into several subcategories, they were separated and counted per subcategory. Statements not specifically asked as a question (i.e., statements without a concluding question mark) were excluded. Initial categories and subcategories were derived from 10 articles and were continually revised and rerevised during the analysis of interrogatives from the remaining case series. After all interrogatives were tentatively categorized, the same two authors conducted a final review of each interrogative to confirm the accuracy in subcategory placement and the continued validity of each category and subcategory. At this stage, any redundancy among subcategories was addressed, and as a result, subcategories collapsed.

Results

Emerged categories and subcategories

The process of identification of surgical case series articles is outlined in Figure 1. From a total of 6307 items listed in the table of contents, 221 case series in Annals of Surgery, Journal of the American College of Surgeons, and JAMA Surgery were identified. This exclusion of case series published without postpresentation discussions and case series published with invited critique and commentary resulted in the exclusion of all JAMA Surgery case series. From the final 56 case series, 476 unique interrogatives were identified and classified into 4 categories and 13 subcategories. The following categories emerged: Application of Results to Patient Care, Clarification of Study Methodology, Facilitation of Author Insight, and Request for Additional Study-Specific Data (Fig. 2).

The first category, Application of Results to Patient Care, included the following subcategories: Changes to Current Standard of Care ($n = 99$), Comparison to Other Procedures ($n = 22$), and Direction of Future Study ($n = 15$) (Fig. 2). In the subcategory, Changes to the Current Standard of Care, discussants were primarily interested in understanding how the

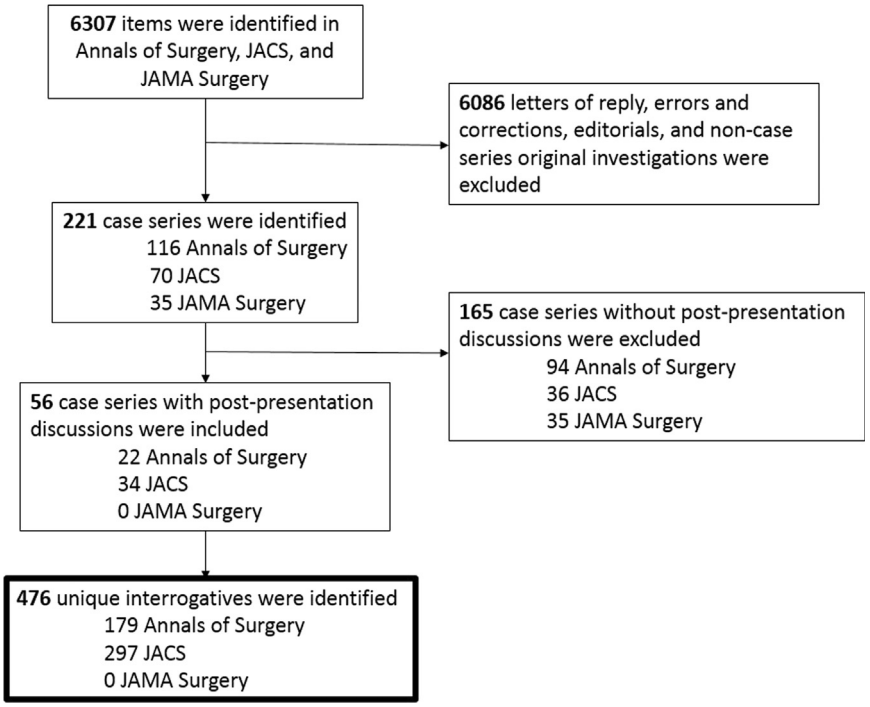

Fig. 1 – Flow chart for identification of case series and interrogatives. The tables of contents of 3 major surgical journals were reviewed from January 2010 to April 2015 to identify case series that included transcripts of postpresentation discussions from national meetings. Studies were excluded if they did not meet the study definition of case series and if they did not feature postpresentation discussions. Line-by-line coding was performed of the included case series ($n = 56$), and 476 unique interrogative statement were identified to be included in the thematic analysis.

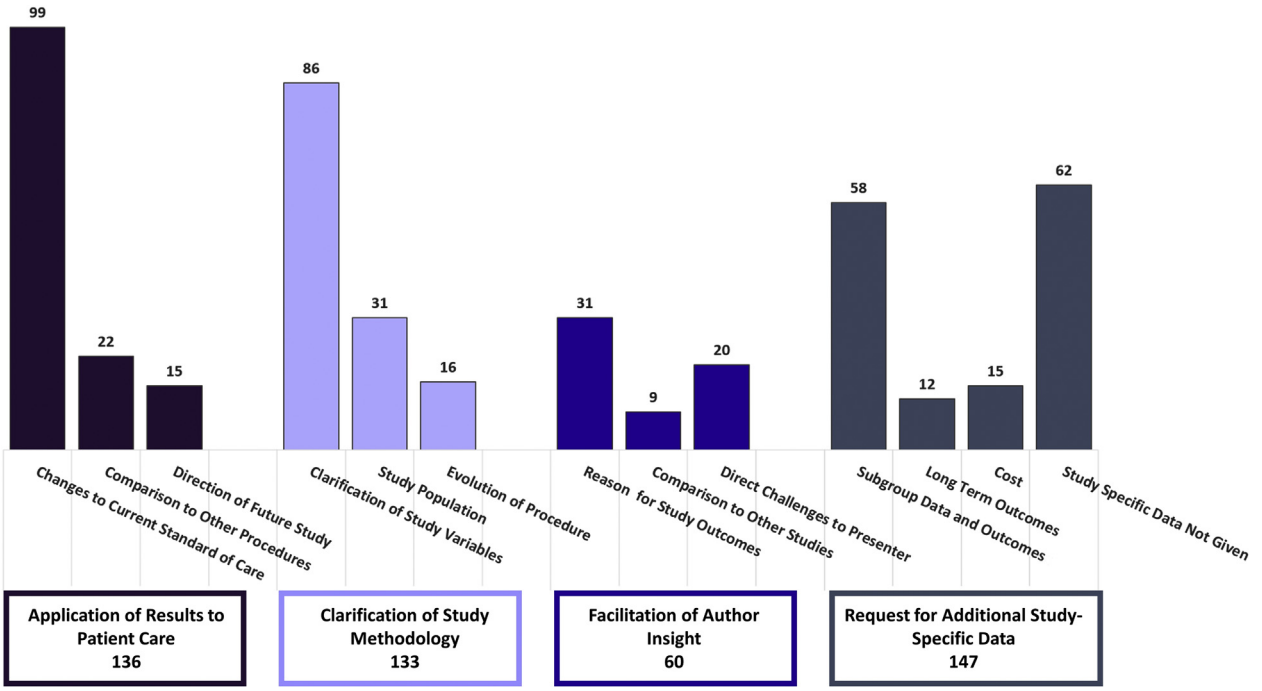

Fig. 2 – Main categories and subcategories identified. All interrogative statements identified were analyzed using thematic analysis, and 4 main categories and 13 subcategories were identified. The total number of interrogative statements belonging to each category and subcategories were summed and are reported as totals. (Color version of figure is available online.)

study results changed the author's current standard of care, specifically questioning whether the results had relevance for the surgeon's clinical practice. However, in the subcategory Comparison to Other Procedures, surgeons asked the authors to compare the presented procedure to the gold standard treatment and/or other approaches. Finally, surgeons requested that authors discuss the direction of intended plans for future study (Table 1). Illustrative quotations that exemplify each subcategory are given verbatim in Table 2.

In the second category, Clarification of Study Methodology, the following subcategories emerged: Clarification of Study Variables ($n = 86$), Study Population ($n = 31$), and the Evolution of Procedure ($n = 16$) (Fig. 2). In the subcategory Clarification of Study Variables, discussants routinely requested that presenters define key study variables and the rationale behind setting variable parameters more specifically. Surgeons requested information about key study personnel and their involvement in the study. Insight into the technical details of the procedure was additionally sought. Comparatively, the subcategory Study Population primarily focused on relevant patient characteristics. Surgeons requested insight into the inclusion and exclusion criteria for patients, specifically the rationale behind choosing an operative or nonoperative approach. In the subcategory Evolution of Procedure, discussants sought specifics on the learning curve of the presented procedure and how the technique changed over time.

The third category, Facilitation of Author Insight, included the following subcategories: Reason for Study Outcome ($n = 31$), Comparison to Other Published Studies ($n = 9$), and Direct Challenges to Presenter ($n = 20$) (Fig. 2). In the subcategory Reasons for Study Outcome, surgeons were mainly interested in the mechanisms responsible for the outcomes identified. In the subcategory Comparison to Other Published Studies, surgeons asked the presenter to contextualize their results in the setting of other relevant published studies. Presenters were asked, in particular, to explain why presented results were different from other studies. The subcategory Direct Challenges to the Presenter involved interrogatives where discussants directly challenged design, execution, and validity of the study and its results.

In the final category, Request for Additional Study-Specific Data, the following subcategories emerged: Subgroup Data and Outcomes ($n = 58$), Long-Term Outcomes ($n = 12$), Cost ($n = 15$), and Study-Specific Data Not Given ($n = 62$) (Fig. 2). The subcategory Subgroups Data and Outcomes highlighted inquiries regarding clarification of subgroup outcome metrics of some smaller subset of the study population for purposes of understanding a more detailed view of the study. In the subcategory Long-Term Outcomes, surgeons asked for follow-up data beyond the specified period presented and specifically questioned the long-term implications of the operation. In the subcategory Cost, surgeons were interested in understanding financial details of the operation, including the cost for the operation and insurance and premiums details. The subcategory Study-Specific Data Not Given included unique interrogatives specific to the study that did not necessarily catalog into any other subcategory, including specialty-specific details in the cases presented.

Table 1 – Categories and subcategories identified by thematic analysis of postpresentation discussions.

Categories/subcategories	Definitions
Application of results to patient care	
Changes to current standard of care	Describe how have the results of the study changed the author's own or institutional standard of care.
Comparison to other procedures	Compare the current alternatives to the researched procedure. Discuss how the presented procedure compares to the gold standard.
Direction of future study	Describe the next trial or study.
Clarification of study methodology	
Clarification of study variables	Define key study variables and the reasoning behind these parameters. Define key personnel. Provide insight into the technical details of the procedure.
Study population	Describe relevant patient characteristics. Explain the inclusion and exclusion criteria for patients into operative and nonoperative groups.
Evolution of procedure	Describe how the technique was used over time or changed. If changed, describe when, and to what extent. Discuss the learning curve.
Facilitation of author insight	
Reason for study outcome	Provide insight into the mechanism responsible for the outcomes.
Comparison to other studies	Describe why the results in your study were different from other similarly published studies.
Direct challenge to presenter	Respond to challenges regarding design, execution, and validity of the study and results.
Request for additional study-specific data	
Subgroup data and outcome	Provide insight into specifics of patients in a subgroup. Compare the outcomes of patients across subgroups.
Long-term outcome	Describe the patient's long-term outcomes from the described surgery.
Cost	Discuss any cost savings of the presented procedure or justifications for the cost of the procedure. Include information about who covers the procedure (insurance, patient, and so forth).
Study-specific data not given	Address unique interrogatives specific to the study.

Table 2 – Key sample quotes used to derive subcategories.

Categories/subcategories	Illustrative quotes
Application of results to patient care	
Changes to current standard of care	"How would the authors apply the results of this study to their practice?"[24] "Has your review of these data changed your approach to the ICU patient?"[25]
Comparison to other procedures	"Have you considered any noncircumferential wraps that could still cover the area of repair?"[26] "How many of the type I aneurysms in your series could have been repaired using current endovascular technology?"[27]
Direction of future study	"So what's the next trial? What's the next big step? What is the prospective randomized controlled trial you wish you had done?"[28] "Do you have any prospective trials in place to properly evaluate prospectively the adjunct use of chemotherapy?"[29]
Clarification of study methodology	
Clarification of study variables	"First, would the authors define functional healing?"[30] "You note duct measurement as being a factor. Was this estimated or actually measured by the operating surgeon?"[31] "What were the definitions that you used to determine this?"[32]
Study population	"Are there people you are not operating on? I noticed that your average patient age was 65, suggesting that this is a highly selected group."[27] "What criteria do you use for operability?"[28] "First, could you tell us more about the 1700 patients with neuroendocrine tumors who were seen during this time? Specifically, how many had midgut tumors that were not resected surgically and what were their outcomes?"[33]
Evolution of procedure	"How do you know that the technique did not change over time?"[25] "Next, what is the learning curve? What are the issues involved in the learning curve? Specifically, is it exposure? Is it using imaging? Is it dissecting from a different vantage point?"[34]
Facilitation of author insight	
Reason for study outcome	"I wonder if you could articulate how you envision Avastin causing a complication so far out from a surgical intervention. What would be the mechanism for this causation?"[35] "Do you have any prospective trials in place to properly evaluate prospectively the adjunct use of chemotherapy?"[29]
Comparison to other studies	"Finally, in the resection group, the 20% recurrence rate for HCC is somewhat lower than that reported for other groups. Do you think this is in part due to the inclusion of the noncirrhotic patients?"[36] "How many of the type I aneurysms in your series could have been repaired using current endovascular technology?"[27]
Direct challenge to presenter	"If it comes down to cosmesis, and truly if you believe that this is important, does this look better than 3 5-mm ports in the subcostal area when they have healed and a hidden 10-mm port site deep in the umbilicus?"[34] "Can you tell us the extent of preoperative and postoperative adjuvant treatments in this reported patient group? That is, what percent of patients received preoperative or postoperative therapy? This potentially could make the benefits of surgical intervention hard to interpret."[33]
Request for additional study-specific data	
Subgroup data and outcome	"Of the patients who had benign fine needle aspiration biopsies and went to surgery, what percentage of those patients had suspicious findings on ultrasound that were confirmed to be malignant?"[37] "Second, there are patients in this series with achalasia… did these patients do well after stent removals because presumably their achalasia remained untreated?"[26] Please clarify how many patients had abdominal perforation, and were their results better or worse than the thoracic perforations as far as morbidity and mortality?[26]
Long-term outcome	"And how do you estimate in consultation on the need for future MRI examination, a current contraindication to a LINX implantation?"[38] "Are there any concerns about the latent effects of prolonged direct exposure of the gastric mucosa to alkaline pancreatic juice in transplant recipients?"[39]
Cost	"How much did the patients actually pay for this life-changing therapy? Is there a way to make this approach widely available at a cost that is affordable?"[40] "In an era in which cost containment is paramount, how has this affected the bottom line? And how would you be able to continue in a grim financial future?"[41]

(continued)

Table 2 – (*continued*)

Categories/subcategories	Illustrative quotes
Study-specific data not given	"How much did the patients actually pay for this life-changing therapy? Is there a way to make this approach widely available at a cost that is affordable?"[40] "In an era in which cost containment is paramount, how has this affected the bottom line? And how would you be able to continue in a grim financial future?"[41]

Discussion

Case series are routinely published in surgical journals but have not been historically subjected to guidelines that ensure they address elements that are important for their surgical audience. To identify what surgeons are largely interested in knowing when evaluating a case series, our analysis focused on questions raised by surgeons during discussions after oral presentations of surgical case series at national meetings. Interestingly, although the case series included in this analysis spanned a broad range of study designs and types of operations, the questions posed by surgeons after the presentations collapsed into only four distinct categories. These categories were focused generally on understanding the structure and findings of the case series so that surgeons can evaluate the potential for change in their practice based on the study's findings.

Elements of case series that were of particular interest to surgeons included the following: Changes to Current Standard of Care, Clarification of Study Variables, Study Population, and Subgroup Data and Outcomes. An overwhelming number of surgeons were interested in understanding how the presenting authors incorporate their research findings in their own practice. Surgeons pointedly evaluated the impact of a case series' findings by asking specifically about its clinical applicability. Providing insight into actual changes to the author's current clinical practice and describing their clinical experience with these changes would provide transparency that is helpful to other surgeons. Defining the main study variables, and more specifically, the rationale behind setting the variable parameters is also crucial. Clearly defining key personnel involved in the study and providing clear insight into the technical details of the procedure would clarify the case series' scope. In addition, detailing specifics of the study population, including how patients were delineated into operative and nonoperative groups with clearly defined inclusion and exclusion criteria, was found to be important to the surgical audience. Finally, details on patient outcomes across different subgroups were also deemed important as they clarify the applicability of the study's findings to a surgeon's own patient population.

The PROCESS guideline, the first published case series reporting guideline, was derived from two Delphi rounds of a survey sent to surgeons and others with significant experience in reviewing or editing case series.[19] We completed all data collection and analysis for our study before the publication of the PROCESS guideline. Our inductively derived categories and subcategories are largely consistent with the PROCESS checklist items. Nearly all items in the PROCESS guideline mapped closely with the study's subcategories, where a number of this study's subcategories mapped to multiple PROCESS guideline elements. Of the greatest interest to us, although the PROCESS guideline is thorough and encompasses an exhaustive checklist of items to improve the utility and validity of case series reporting, the most prevalent subcategory identified in our study, Changes to the Current Standard of Care, was not represented in the published checklist. Our findings suggest that surgeons are particularly interested in knowing how reporting surgeons incorporated study findings into their own practice, and this key element should be considered essential for published case series. We propose surgical case series authors refer to and incorporate a short list of criteria as they prepare their article to ensure surgeons evaluating their findings are able to determine clinical applicability for their own practice (Table 3).

Our study had several limitations. First, we only analyzed transcripts of discussions of case series presented at national meetings. Unpublished questions following case series presentations that are not led by formal discussants and questions from audience members who chose not to ask them in a formal setting could include other relevant themes that we were unable to capture. Admittedly, some discussion questions and comments are merely extemporaneous. To address this, we included a large number of discussions presented at major national meetings in our analysis. A portion of the discussions were prepared in advance, and, importantly, we excluded comments that were not interrogatives from our analysis to minimize the impact of less-relevant speech. Second, we were only able to analyze those presentations published in English, which limits our ability to assess some international surgeons' perspectives. In addition, surgeons who attend national meetings represent a subgroup of all surgeons who may not necessarily have the similar perspectives. Future studies to survey a larger number of surgeons and compare their more private views on cases series

Table 3 – Key criteria of a surgical case series authors should include to ensure readers can evaluate the clinical applicability.

1. Define the **patient population**. Include what criteria were used to separate patients into operative and nonoperative groups (if applicable).
    1.1. Address **important subgroups** in the patient population and present outcomes separately by group.
2. Clearly define the **main study variables** and describe the rationale for choosing those variables to study.
3. Clearly describe the **technical details of the procedure(s)**.
    3.1. Delineate who are the key personnel involved in the study.
4. Describe any **changes made to the author's or the institution's standard of care** as the result of the findings of this case series.

elements to those detected in this study would be of interest. Finally, our study aimed only to determine themes that are important to surgeons evaluating case series rather than to evaluate case series articles compliance with these criteria at the time of publication. Further studies analyzing case series articles to determine adherence to our derived categories and subcategories would help determine how frequently these elements are addressed.

In conclusion, standardization of case series reporting will help achieve maximum utility to readers of surgical case series, which are recognized to be of practical value in the surgical community. This study identifies core elements of a case series that surgeons use to evaluate the utility of a case series and make conclusions about changes to their own practice. Encouraging authors to comment on any changes they made to their practice as a result of their findings would improve surgical audience's ability to evaluate a case series' clinical applicability. In particular, surgeons should explicitly state whether they have or have not adopted the recommendation of the case series conclusion into their own and/or their group's practice.

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Authors' contributions: E.R.W. and A.B.S. designed the study, performed the literature search and data collection, and performed the qualitative content analysis. A.B.S. and V.R.R. prepared the initial article. All authors contributed to data analysis and interpretation as well as critical revision of the article.

Disclosure

The authors report no proprietary or commercial interest in any product mentioned or concept discussed in this article.

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