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Original Article

CARE guidelines in publishing case reports in paediatrics: where do we stand after 10 years?

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Abstract

Background: Case reports are especially important in paediatrics, and CARE (CAse REport) guidelines help in standardizing the reporting in case reports.

Objectives: To examine the actual use of CARE guidelines in journals in the field of paediatrics.

Methods: Journals that publish case reports were selected from the databases of the Web of Science Core Collection (WoSCC; Science Citation Index Expanded, or SCIE; and Emerging Sources Citation Index, or ESCI). All journals that publish case reports and mention CARE guidelines were included, and the ranking (quartiles) of those journals was also recorded. From all the journals in paediatrics that mention CARE in their instructions for authors, 5% of all the open-access case reports were selected (limited to 10 reports from any one journal), and every 10th case report was included in the analysis. The reports published between 2013 and 2023 were further analysed for their compliance with the 13-item CARE checklist.

Results: Of 184 journals in the field of paediatrics category included in the WoSCC, 130 (71%) were indexed in the SCIE and 54 (29%) in the ESCI; 161 (87%) publish case reports; and 121 (65%) mention CARE guidelines in their instructions for authors. However, they differ in applying CARE guidelines ($P = .001$), and more journals included in the ESCI mention CARE guidelines than do those included in the SCIE. During 2013–2023, a total of 22,989 case reports were published in the 121 journals that mention CARE guidelines. Of the total, 6733 (29%) were open access. Our final sample comprised 326 (5%) open access case reports that were open access, of which 240 (74%) were in the journals included in the SCIE and 86 (26%) in the ESCI. On average, these reports were given a score of 8.5 (SD 1.97; range, 2–13) out of the maximum possible score of 13. The highest compliance was observed for the informed consent item (99%), while the lowest compliance was found for the keywords item (22%).

Conclusion: It is important for journals to ensure that during writing and editing, the case reports they publish adhere to CARE guidelines so as to eliminate biased reporting and improve their quality.

Keywords:

CARE guidelines, case reports, paediatrics journals, scholarly publishing

Introduction

An indispensable part of medicine and related professions is continued, even daily, learning to improve medical care and to help the end user of medical services, namely the patient. Such learning, or the transfer of knowledge, occurs mostly through books, working in interdisciplinary teams, guidance from or collaboration with more experienced colleagues in a given field, and scientific articles that contain up-to-date information on a particular diagnosis. Sometimes, such knowledge transfer is not fast enough for rare diseases, and we have to rely on medical journals that publish case reports, which represent the most traditional form of dissemination of medical knowledge and have been an integral part of medical literature throughout history.[1,2]

However, the importance of publishing case reports in medicine remains a matter of debate. Especially when rare cases are involved or working conditions are difficult, such as during the recent COVID-19 pandemic, case reports have proven indispensable for the profession as an efficient channel to publish relevant medical information quickly and to reach a wider medical audience. Case reports are particularly important in paediatrics because they offer an optimal way of disseminating information on new or rare diseases or overlapping syndromes that are usually hard to diagnose clinically.[3]

Case reports, as a category of publications in biomedicine, should provide new information concisely. Currently, different sets of guidelines are available on writing case reports, such as CARE (CAse REport) guidelines, SCARE (Surgical CAse REport) guidelines, and SCRIBE (Single-Case Reporting guideline In BEhavioural interventions) guidelines, which were first published in 2016 as a tool for reporting surgical cases,[4] and are used for writing papers for publication in a scientific journal using a specific type of research design, namely the single-case experiment design.[5] In the present research, we focused on CARE guidelines because they are broader.

For example, in the multisystem inflammatory syndrome in children (MIS-C) as an early complication of COVID-19, case reports were the first form of published information for medical practitioners dealing with this clinical entity and adverse events in treating this disease.[6] However, what was missing in some cases was consistency in the style of reporting and standardized presentation of data—which is exactly why CARE guidelines are a very important—if not crucial—tool in the standardized presentation of case reports. The guidelines,[7] published in 2013,[8] were designed by a group of experts to maintain high levels of accuracy, transparency, and usefulness of case presentation and are in the form of a checklist comprising thirteen items: for a given case report to be considered satisfactorily written, it must include all of them.

It was against this background that the present study sought to assess the actual use of CARE guidelines as a useful tool in medical journals, particularly in paediatrics, by examining the instructions for authors of case reports in paediatrics journals for specific mention of the CARE guidelines.

Materials and Methods

Selection of Journals

The journals that publish case reports were selected from the Web of Science Core Collection (WoSCC) under the category "Clinical Medicine – Paediatrics", both in SCIE (Science Citation Index Expanded) and ESCI (Emerging Sources Citation Index). The instructions for authors of those journals were examined, and all journals that publish case reports *and* mention the CARE guidelines were included. The ranking of journals

(quartiles) by the WoSCC was also recorded (Supplement 1, Total list of journals).

The analyses were conducted in June 2024 and covered the period 2013–2023.

Analysis of Case Reports

Selection of Case Reports

From all the case reports published in the selected journals, 5% were selected using the PubMed database, and every 10th case report was chosen for the analysis. If a journal had published more than 100 case reports during the study period, only 10 were chosen; if it had published fewer than 10, at least one was included, specifically the first one published during the study period (Supplement 1, Total list of journals).

Analysis of CARE Checklist

CARE guidelines include a checklist comprising 13 items that are essential to a case report. Accordingly, in studying the application of the CARE checklist,[7] we assigned each case report a score ranging from 0 to 13. Because some of the items have sub-items, scoring was done in such a way that only a fully completed item (including any sub-items) was awarded 1 point. The items are as follows: title, keywords, summary, introduction, patient information, clinical findings, timeline, diagnostic evaluation, therapeutic intervention, follow-up and outcome, discussion, patient perspective, and informed consent.

To avoid bias, the analysis was performed by two researchers (SŠ and APŠ) independently, and the score for each point was calculated as the average of the scores awarded by both.

Statistical Analysis

Cohen's kappa value was calculated to measure inter-rater reliability between the two researchers who had checked the number of completed items from the CARE checklist. Cohen suggested that a kappa result between 0.81 and 1.00 can be considered to indicate a near-perfect agreement.[9]

Further, the results were also analysed using descriptive statistics, frequency and percentage, or the median and percentile for total scores according to the ranking of the journal and *post-hoc* Kruskal–Wallis test for all pairwise comparisons. The difference between the quartiles and the SCIE and ESCI databases was calculated using the χ^2 test. Statistical analysis was performed using Statistic 14.0.1, TIBCO software version 2022, and MedCalc (MedCalc Software, Ostend, Belgium).

Results

Characteristics of Paediatrics Journals Publishing Case Reports

Of the 184 paediatrics journals included in the WoSCC, 130 (71%) were indexed in the SCIE and 54 (29%) in the ESCI. Of these journals, 161 (87%) publish case reports and 121 (66%) mention CARE guidelines in their instructions for authors (Table 1). More ESCI journals (n = 48; 89%) mention CARE guidelines in their instructions for authors than SCIE journals do (n = 73; 56%; $P > .001$).

Table 1. Proportion of Paediatrics Journals in the Web of Science Core Collection that Publish Case Reports and Mention CARE Guidelines in Their Instructions for Authors

Web of Science Core Collection	SCIE[a]		ESCI[b]		Total (n)
	n	%	n	%	
Total paediatrics journals	130	71	54	29	184
Publish case reports	110	68	51	32	161
Mention CARE guidelines	73	60	48	40	121

[a]Science Citation Index Expanded.
[b]Emerging Sources Citation Index.

The distribution of the journals in terms of the extent to which they use CARE guidelines and the ranking of those journals are presented in Figure 1. The journals differed significantly ($P = .001$) in mentioning the

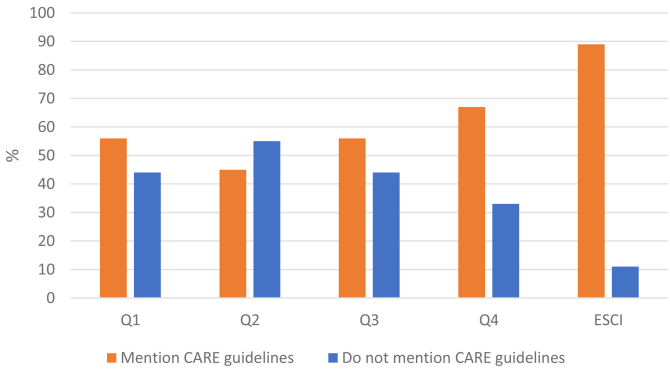

Figure 1. Distribution of journals that mention CARE guidelines in their instructions for authors, by journal ranking (quartiles) in the Web of Science Core Collection.

guidelines depending on whether they were covered in ESCI (89% of the journals) or in SCIE (20%–30%). Of the 73 journals that mentioned CARE guidelines, 18 (25%) were in the first quartile (Q1); 15 (20%), in Q2; 18 (25%), in Q3; and 22 (30%), in Q4.

Analysis of case reports

During the chosen period (2013–2023), the 121 paediatrics journals published a total of 22,989 case reports (PubMed data; Supplement 1, Figure 1), of which 6733 (29%) were open access. Our final sample comprised 326 case reports, of which 240 (74%) were in the SCIE journals and 86 (26%) in the ESCI journals.

Case reports were analysed by two independent researchers, and the inter-rater reliability was very high (Cohen's kappa coefficient of 0.95; 95%, CI 0.92–0.98). The distribution of analysed case reports according to the journal ranking is presented in Table 2.

Table 2. Distribution of Analysed Case Reports Published in Journals Included in the Web of Science Core Collection, by Journal Rank (Quartile)

	Quartile	Case Reports Analysed	
WoSCC		n	%
SCIEa	Q1	93	29
	Q2	77	24
	Q3	29	9
	Q4	44	13
ESCIb		83	25
	Total	326	100

[a]Science Citation Index Expanded.
[b]Emerging Sources Citation Index.

All the 326 case reports were examined for the extent to which they were compliant with the checklist that forms part of the CARE guidelines, and each report was assigned a score that reflected the extent of compliance. The distribution of the 326 reports by their score is presented in Figure 2. The average score was 8.50 (SD 1.97) and it ranged between 2 and 13.

The compliance score differed with the journal rank (quartile) ($P < .001$): journals placed in the second and third quartiles and ESCI journals with median values of 9.0 and 9.5 showed the greatest compliance (Figure 3 and Table 3; the table presents the results of the post-hoc Kruskal–Wallis test).

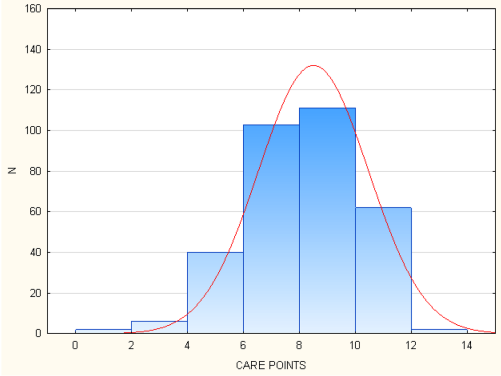

Figure 2. Distribution of 326 case reports by their score that reflects compliance with the checklist in CARE guidelines.

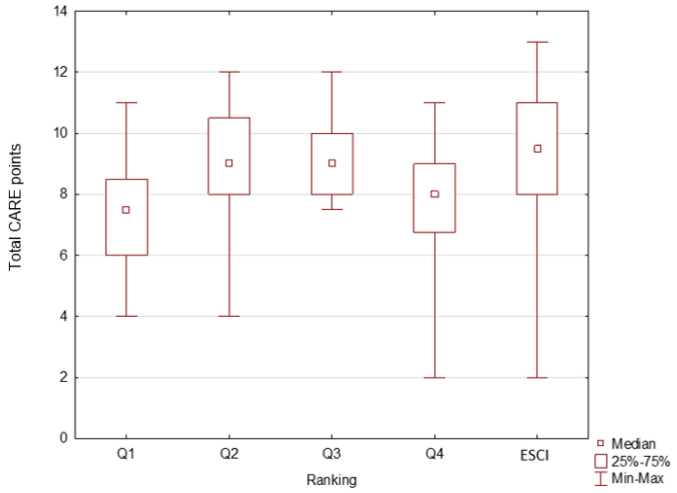

Figure 3. Distribution of compliance score (no. of fully completed items from the 13-point checklist), by journal rank (quartile).

The CARE guidelines checklist comprises 13 items, and Table 4 shows the distribution of the 326 case reports by their compliance with each of the 13 items. "Informed consent" recorded near-total (99%) compliance, whereas the item that showed the lowest compliance (22%) was "keywords".

Discussion

The publication of case reports, a high-quality source of information, is crucial for the advancement of biomedical sciences and the welfare of patients, and CARE guidelines are an excellent tool to produce high-quality case reports. The first step towards this end is for journals to include CARE guidelines in their instructions for authors. The present research showed that of a total of 184 paediatrics journals included in WoSCC, 121 (66%) journals mention CARE guidelines in their instructions for authors (Table 1), although the journals differ significantly among themselves in mentioning the guidelines, with the number of journals that mention the guidelines being greater among ESCI journals than among SCIE journals.

In terms of the score assigned to each report according to its compliance with the checklist, journals in Q2 and Q3 and the ESCI journals published reports that scored higher (on average, 9 out of a maximum score of 13)—probably a reflection of the journals' aspiration to move to a higher quartile, from Q3 to Q2 or from Q2 to Q1, or to progress from being in the ESCI to being in the SCIE group of journals.

A closer look at the extent of compliance with different items in the checklist shows the compliance to be very high for

Table 3. Distribution of Compliance Score (no. of Fully Completed Items From the 13-Point Checklist) by Journal Rank (Quartile) and Post-Hoc Test for all Pairwise Comparisons

Factor	No. of Journals	Median	25th to 75th Percentile	Different ($P < .05$) from Factor nr
(1) ESCI	83	9.5	8.0–11.0	(2) (5)
(2) Q1	93	7.5	6.0–8.5	(1) (3) (4)
(3) Q2	77	9.0	8.0–10.5	(2) (5)
(4) Q3	29	9.0	8.0–10.0	(2) (5)
(5) Q4	44	8.0	6.7–9.0	(1) (3) (4)

Table 4. Compliance of Case Reports with Each Item in the CARE Guidelines Checklist (n = 326)

	Compliant		Non-compliant		No Concordance	
Item in Checklist	**n**	**%***	**n**	**%***	**n**	**%***
Title	233	72	92	28	1	0
Keywords	71	22	243	74	12	4
Abstract	199	61	115	35	12	4
Introduction	271	83	44	14	11	3
Patient information	270	83	48	15	8	2
Clinical findings	259	79	64	20	3	1
Timeline	157	48	148	46	21	6
Diagnostic assessment	275	84	47	15	4	1
Therapeutic intervention	168	52	154	47	4	1
Follow-up and outcome	141	43	171	52	14	5
Discussion	272	83	54	17	-	
Patient perspective	87	26	237	73	2	1
Informed consent	321	99	1	0	4	1

No concordance refers to the number of case reports in which the two researchers who scored for compliance disagreed.
*The percentages are rounded.

introduction, patient information, discussion, and informed consent (Table 4). The highest compliance was for the item of informed consent (99%), probably due to the high ethical standards required by the journals; that with respect to diagnosis, because diagnosis is the foundation of a good case report; and that with patient information, introduction, and discussion, because these are critical to the case report being considered acceptable for publication. On the other hand, patient perspective showed poor compliance, probably because of the lack of patient follow-up, and keywords showed poor compliance because of the poor choice of keywords.

For journals in the field of biomedical sciences and other related fields, it is extremely important to follow CARE guidelines because compliance strongly influences the quality and value of the information presented to interested readers.[10] Ortega and co-workers emphasize that the medical education community should be aware of the importance of publishing good-quality case reports.[11]

In writing up case reports, it is important to follow CARE guidelines to ensure that all the important information is presented consistently and appropriately.[12] This proved particularly important during the COVID-19 pandemic, when information and knowledge about extremely rare comorbidities could be shared quickly and efficiently only through case reports. Failure to follow the guidelines can lead to incomplete and unclear steps in the diagnosis, treatment, or success of a particular therapy.[13]

Although 10 years have passed since the publication of CARE guidelines, it is evident that they are yet to be widely used by journals in editorial work. It is therefore necessary to make medical editors more aware of CARE guidelines and to mention them clearly in the instructions for authors. In this way, the quality and usability of the data contained in the case reports can be improved. In view of the high – and rising – proportion of case reports, it is clear that they continue to be of great importance in medicine, especially in paediatrics.[14] Similar problems exist in other medical fields, such as oncology and

emergency medicine. Kaszkin-Bettog and Hildebrandt emphasize in their study how useful case reports are for new surgical procedures or for the use of new drugs in oncology when it is impossible to conduct a randomized controlled trial given the small number of patients.[15] In addition, Richason and co-workers point out another problem with case reports in emergency medicine, namely the lack of important details about treatment, intervention, outcome, or causality. Clinicians often read case reports to know how to act in rare cases, and incomplete reports can lead to inappropriate treatment to the detriment of the patient.[16] We know how much we need translational medicine in our daily work, not only from science into practice but in the reverse direction as well. The way to important information and good publication is through quality work, and quality work is only possible if you follow instructions, especially if they are well known and represent standards in a given field.

Journals in Q1 should adhere to these guidelines more consistently, although our research shows that they tend to neglect this aspect. It is important to follow the guidelines during the editorial process to ensure unbiased reporting, which can benefit patients, clinicians, and researchers as well as medical journals.[17,18]

This study has its limitations: first, it focused only on paediatrics journals and not on journals across the broad area of biomedicine; second, the choice of case reports for analysis was limited to open-access case reports, which may not be fully representative of all published case reports.

Compared to large studies and papers reporting original research, case reports usually offer insufficient evidence. Yet, they are important because they often deal with new research topics quickly and also highlight rare cases—and can become even more important and valuable if strengthened by careful and standardized reporting compliant with the checklist offered by the CARE guidelines.

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