Identifying Inconsistencies and Reporting Deficits in Therapeutic Massage and Bodywork (TMB) Case Reports Authored by TMB Practitioners: a TMB-Adapted CAse REport (CARE) Guidelines Audit Through 2014†

Niki Munk, PhD, LMT,[1*] Sarah Shue, MS,[1] Emilee Freeland,[1] Rick Ralston, MSLS,[2] Karen T. Boulanger, PhD, CMT[3]

[1]*Department of Health Sciences, Indiana University–IUPUI, Indianapolis, IN,* [2]*Indiana School of Medicine, Ruth Lilly Medical Library, Indianapolis, IN,* [3]*Stanford University School of Medicine, Stanford, CA, USA*

Introduction: **Case reports are a fundamental tool through which therapeutic massage and bodywork (TMB) practitioners can inform research and impact their field by detailing the presentation, treatment, and follow-up of a single individual encountered in practice. Inconsistencies in case reporting limit their impact as fundamental sources of clinical evidence. Using the TMB-adapted CAse REport (CARE) guidelines, the current study sought to provide a rich description regarding the reporting quality of TMB practitioner authored TMB case reports in the literature.**

Methods: **1) Systematic identification of published, peer-reviewed TMB case reports authored by TMB practitioners following PRISMA recommendations; 2) audit development based on TMB-adapted CARE guidelines; 3) audit implementation; and 4) descriptive analysis of audit scores.**

Results: **Our search identified 977 articles and 35 met study inclusion criteria. On average, TMB case reports included approximately 58% of the total items identified as necessary by the TMB-adapted CARE guidelines. Introduction sections of case reports had the best item reporting (80% on average), while Case Presentation (54%) and Results (52%) sections scored moderately overall, with only 20% of necessary Practitioner Description items included on average. Audit scores revealed inconsistent abstract reporting and few audited case reports including client race (20%), perspective (26%), and occupation/activities (40%); practitioner practice setting (12%), training (12%), scope-of-practice (29%), and credentialing (20%); adverse events or lack thereof (17%); and some aspect of informed consent (34%). Treatment descriptor item reporting varied from high to low. Various implications of concern are discussed.**

Conclusion: **The current audit and descriptive analysis highlight several reporting inconsistencies in TMB case reports prior to 2015. Reporting guidelines for case reports are important if standards for, and impact of, TMB case reports are desired. Adherence to reporting specifications outlined by the TMB-adapted CARE guidelines could improve the impact and usability of TMB case reports in research, education, and practice.**

KEY WORDS: reporting compliance; REDCap; audit development; massage therapy; practitioner author; adverse events; informed consent

INTRODUCTION

Case reports are a fundamental tool through which practitioners in applied disciplines are able to inform research and impact their field by detailing the presentation, treatment, and follow-up of a single individual encountered in practice. Ideally, published case reports contribute to reductions in the research/practice gap by allowing practitioners to describe current practice situations and outcomes to other practitioners, educators, and researchers. Unfortunately, inconsistencies in case reporting across applied disciplines have limited the impact of these fundamental sources of clinical evidence. In 2013, the CAse REport (CARE) reporting guidelines were published to standardize the reporting of medical case reports.(1) In recognition of discipline specific reporting needs, the therapeutic massage and bodywork (TMB)-adapted CARE guidelines were published in late 2014 to specifically guide the reporting of case reports involving TMB applied as a treatment.(2) The TMB-adapted CARE guidelines identified five primary case report components (Pre-Manuscript, Introduction, Case Presentation, Results, and Discussion), eight subcomponents (title, keywords, abstract within the Pre-Manuscript component and client information, measures, practitioner description, intervention description, and consent within the Case Presentation component), and several single reporting items necessary for all published case reports, when applicable. Exclusions of whole components/subcomponents or key reporting items within a

†Supplemental materials available at http://ijtmb.org

case report may diminish its usability and significance from both a qualitative and quantitative (present/absent) standpoint. For example, a lack of detail in intervention descriptors limits the reproducibility of a treatment approach for practitioners and educators (qualitative standpoint), while the report will have diminished validity and/or worth for researchers (or any other critical reader) attributing such exclusions (quantitative standpoint) as lack of rigor and diminished evidence for purported outcomes.

By checking for the presence of each reporting item within components and subcomponents included in any given case report (i.e., an audit), a summary score for TMB-adapted CARE guidelines compliance can be derived. Such a score could give a general indication of how thorough any given case report is in reporting pertinent details to potentiate a case's impact and usability in practice, education, and/or research. A consideration of which component and subcomponent items are inconsistently reported by TMB case reports could give educators' and practitioners' information on areas in which focused remediation and training could be implemented. One of the objectives of the TMB-adapted CARE guidelines is to improve the consistency of TMB case report reporting in an effort to make information conveyed in such publications more usable and applicable to others' clinical experiences, research, best practices consideration, and education.

In order to compare the thoroughness of TMB case reporting before and after the TMB-adapted CARE guidelines' publication, a preguideline state of TMB case reports is needed. The current study seeks to provide a rich description about the quality reporting of TMB practitioner authored TMB case reports in the literature prior to 2015 through a systematic identification of published, peer-reviewed case reports and audit. This article will outline the methods of the case report identification and audit, report the results of the audit, discuss the pertinent implications of the audits findings, and provide suggestions to improve TMB case reports in the future.

METHODS

Methods for this study include the identification of articles, audit development, audit implementation, and analysis of the audit scores. Identification of articles and audit development occurred simultaneously. EndNote X7.3.1 and EndNote online (http://endnote.com) were used organize and manage the references identified. For audit development and implementation, the study utilized REDCap (Research Electronic Data Capture),[3] a secure, web-based application designed to support data capture for research studies, providing: an intuitive interface for data entry; audit trails for tracking data manipulation and export; and automated export procedures.

Identification of Articles

Search strategy

The systematic identification of published, peer-reviewed TMB case reports authored by TMB practitioners followed the recommendations in the PRISMA statement.[4] In August 2014, we performed a systematic search of PubMed and CINAHL for case reports involving TMB applied as a treatment. Supplemental searches were performed in January and August 2015. Databases were searched from inception to publication year 2014. Search strategies combined database-specific subject headings and keyword variants for two main concepts—massage therapy and case reports or case studies. Results were limited to the English language. The MeSH term "Therapy, Soft Tissue" and the publication type "Case Reports" were used in PubMed, followed by a CINAHL search using the subject headings "massage therapists," "massage", and "reflexology" with the publication type "Case Study"). Supplemental searches used the same CINAHL search and a keyword search in PubMed (acupressure, shiatsu, zhi ya, chih ya, reflexology, rolfing, bodywork, massage, case report, case reports, case study, case studies NOT carotid sinus massage, heart massage, cardiac massage, animals) was used. A master's-level medical librarian (RKR) conducted the database searches.

Inclusion and exclusion criteria

Case reports, studies, or series were included in the audit if they were in English, published in a peer-reviewed journal, and reported treatment performed by a TMB practitioner who also had a role in the case's reporting and publication. Reports, studies, or series reporting self-applied treatments or treatments performed under scopes of practice other than TMB specifically (e.g., nursing, physical therapy, athletic training) or on animals were excluded from this audit. Case reports, studies, or series were included in the audit regardless of condition addressed, TMB technique(s) applied, or recipient population.

Article screening

Article screening for inclusion in the study from those retrieved by the search occurred in three phases primarily undertaken by one co-primary investigator (NM). First, source and article titles were reviewed to eliminate articles from nonpeer-reviewed publications and those falling under the scopes of cardiology (cardiac massage), ophthalmology (ocular massage), and other medical applications. Next, article abstracts were reviewed against the inclusion criteria and eliminated if: a) the TMB treatment was applied by non-TMB practitioner(s) (e.g., chiropractors, doctors, nurses, physical therapists) and/or were included as part of treatment plans under another scope of practice; b) the article was a theoretical discussion of a treatment approach with a hypothetical situation

or an anecdotal example from practice serving as a "case,"; or c) the article reported a study design other than a case report, study, or series (e.g., clinical trial). Finally, whole articles were acquired and reviewed against the inclusion criteria for those in which eligibility was unclear from the abstract (usually due to lack of or unclear practitioner or application context descriptors). The co-primary investigators (NM and KB) began the article selection process together to establish consistency and to fine-tune the inclusion/exclusion criteria. Once established, NM completed the article selection process, and a sample of excluded titles, abstracts, and articles was reviewed by KB through bi-weekly conference calls.

Audit Development, Implementation, and Audit Data Extraction

Audit parameters were established in tandem with article identification by co-investigators NM and KB, authors of the TMB-adapted CARE guidelines,[2] upon which the parameters were based. Audit parameters were divided into primary component and subcomponent groups reflective of the logical organization schema of an article—Pre-Manuscript, Introduction, Case Presentation, Results, and Discussion—which also align with identified necessary manuscript headings and subheadings.[2] Key reporting items identified as necessary for every case report[1,2] were included in the audit, while reporting items only necessary when applicable, such as whether psychometric properties were reported for standardized measures or changes were made to the treatment plan, were excluded. Ultimately, the audit schema was developed such that every article included had the potential to earn all audit points. The specific audit schema is presented in Table 1. Audit schema reporting items were organized by audit components/manuscript headings and subcomponents/manuscript subheadings as appropriate. Disproportionate to reasonable "weight" within the final audit score, 16 items were identified as necessary from the Pre-Manuscript component; 12 of which were in the Abstract subcomponent. To decrease this single component's influence on the overall article audit score, each Pre-Manuscript item was assigned a value of 0.5, resulting in a total of up to 8 points for the Pre-Manuscript component.

Prior to the audit, a REDCap form (see Supplementary Materials Appendix A) was developed for use by two independent study auditors to systematically assess and store whether or not each case report, study, or series included audit components and subcomponents in the publication. Two research assistants (authors SS and EF) served as auditors, and each independently read and completed a REDCap form for each article. REDCap compared the two forms to identify fields in which agreement discrepancies existed between the two auditors (agreement discrepancies for audited components were the result of one auditor identifying the reporting of an audit component while the other did not). Agreement discrepancies were resolved through weekly, in-person discussions between auditors and verified in weekly lab meetings with the co-primary investigator (NM). All discrepancies were reconciled and the agreed-upon indications entered into the verified dataset.

Analysis

Once all identified articles were read, audited, and verified, data from the REDCap form were exported into SAS 9.3 within which all audit score code was written (available upon request) and descriptive statistics ran by co-primary investigator NM. Continuous data (i.e., component and subcomponent scores derived as sum of items reported) are reported as means and standard deviations. Counts of how many audit included articles reported each component and subcomponent item are reported as frequencies and percentages.

RESULTS

The systematic search for articles identified 977 unique citations that were screened for inclusion in the audit. Figure 1 is the flow diagram for article inclusion based on PRISMA specifications[4] and resulted in N = 35 case reports completed and authored by TMB practitioners in the peer-reviewed literature prior to 2015. All 35 articles were included in the audit.[5-39]

Component and Subcomponent Scores and Frequencies/Percentages

Component (headings) and subcomponent (subheadings) score means and standard deviations are reported in Table 2, along with total points possible and actual audit score ranges. The mean total compliance score (range 7.5–38.5 out of 50) for study articles indicated that, on average, TMB cases published prior to 2015 included approximately 58% of the items identified as necessary by the TMB-adapted CARE guidelines. The article section component/heading with the most robust scoring for the cases was the Introduction, with average scores obtaining 80% of the possible Introduction item points. The Case Presentation and Results sections scored the poorest, obtaining an average of 54% and 52% of the possible item points, respectively. Within Case Presentation, Practitioner Description was the lowest scoring subcomponent with average section score obtaining only 20% of the possible points.

Frequencies and Enhanced Description

Figures 2 and 3 present the frequency of audited cases (N = 35) that included specified items within

Table 1. Audit Schema with Individual Audit Items Arranged by Component and Subcomponent Delineations

Component/Manuscript Heading	*Subcomponent/Manuscript Subheading*	*Item Description/Detail*
Premanuscript (Worth 8 Total Audit Points)	Title[a] "Does the title contain:"	The phrase "case report", "case study", or "case series"
		Intervention
		Condition of interest
	Keywords[a]	Are keywords identified?
	Abstract[a] "Does the abstract include:"	Is there an abstract?
		Client descriptors – demographic
		Client descriptors – medical history/diagnosis
		Measures
		Treatment – approach: techniques used
		Treatment – application: number of total sessions
		Treatment – application: length of sessions (e.g., 30 min)
		Treatment – application: frequency of sessions (e.g., weekly)
		Treatment – application: duration of sessions (e.g., for 4 weeks)
		Practitioner descriptors – scope of practice
		Results
		Take-away lesson(s)
Introduction (Worth 4 Total Audit Points)	"Does the introduction include:"	Literature review of the intervention
		Literature review of the condition
		Report's objective
		Report's contribution to the literature
Case Presentation[b] *(Worth 26 Total Audit Points)*	Client Information "Does the article include client related:"	Age
		Gender
		Race
		Occupation or related activities
		Main complaints
		Medical/Condition history
		Timeline of important dates/times associated with the case/condition
		How diagnosis(es) were verified by practitioner
		Practitioner's clinical assessment
	Measures "Does the article include:"	What was measured (outcomes of interest)
		How outcomes of interest were measured
		Scope of practice
	Practitioner Description "Does the article include practitioner related:"	Practice setting
		Duration of practice/experience
		Training
		Credentialing
	Intervention Description "Does the article include:"	Techniques used
		Total number of treatments
		Length of individual treatment(s)
		Frequency of treatments
		Course of treatment duration
		Rational for treatment plan administration
		"Geographical" areas addressed
		Details regarding time spent in specific areas
		Details regarding time spent on different techniques
	"Does the article include:"	Any mention of client (informed) consent to – treat, participate, and/or publish

Table 1. Audit Schema with Individual Audit Items Arranged by Component and Subcomponent Delineations (Continued)

Component/Manuscript Heading	*Subcomponent/Manuscript Subheading*	*Item Description/Detail*
Results[b] *(Worth 6 Total Audit Points)*	"Does the article include:"	Baseline for main outcome of interest
		Baseline for all introduced outcomes/measures
		Outcome for main outcome/measure of interest
		Outcome for all introduced outcomes/measures
		Description client adherence and/or tolerance to treatment intervention/plan
		Any mention of adverse events specifically whether a) none occurred, b) related to treatment, and/or c) unrelated to treatment
Discussion[b] *(Worth 6 Total Audit Points)*	"Does the article include:"	Strengths of the intervention provided
		Limitations of the intervention provided
		Compare and integrate case findings with the relevant health care literature
		Client/patient perspective (comments shared regarding their experience)
		Rationale for why the outcomes observed (may have) occurred
		Provide "take-away" lessons related to the case

[a]Audit points earned for each item in the Pre-Manuscript component are worth ½ point.
[b]Items included in these component and subcomponent scores were issued regardless of manuscript reporting location.

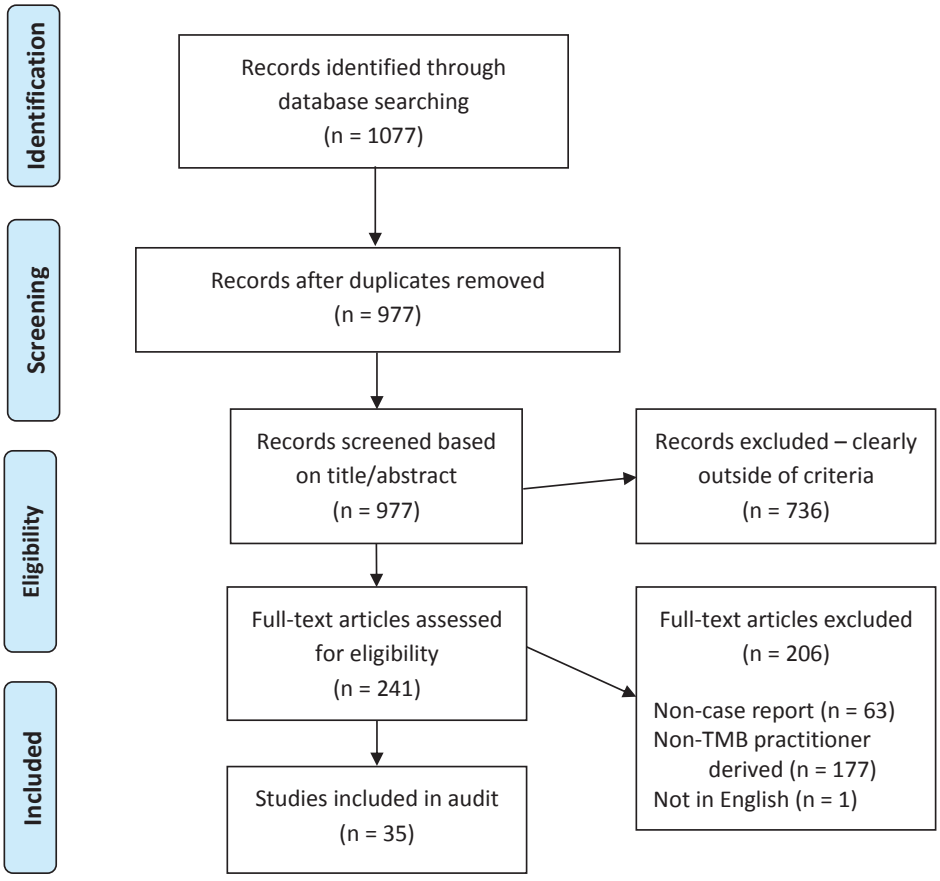

Figure 1. Article identification and inclusion flow diagram.[4]

Table 2. Audit Component and Subcomponent Score Configuration and Results (N=35)

Manuscript		*Total Possible Points (Actual Range)*		*Mean (SD)*	
Components	*Subcomponents*	*Components*	*Subcomponents*	*Components*	*Subcomponents*
Premanuscript		8 (1.5–7.5)		4.8 (±1.8)	
	Title		1.5 (0.5-1.5)		1.3 (±0.3)
	Keywords		0.5 (0-0.5)		0.4 (±0.2)
	Abstract		6 (0-5.5)		3.2 (±1.6)
Introduction		4 (1–4)		3.2 (±0.9)	
Case Presentation		26 (4–20)		14.0 (±3.9)	
	Client Info		9 (1-9)		5.3 (±1.7)
	Measures		2 (0-2)		1.6 (±0.7)
	Practitioner Description		5 (0-5)		1.0 (±1.3)
	Intervention Description		9 (0-9)		5.7 (±2.3)
	Informed Consent		1 (0-1)		0.3 (±0.5)
Results		6 (0–6)		3.1 (±1.6)	
Discussion		6 (0–6)		4.0 (±1.4)	

Total Possible Compliance (Actual Range)	*Mean (SD)*
50 (7.5–38.5)	29.0 (±7.7)

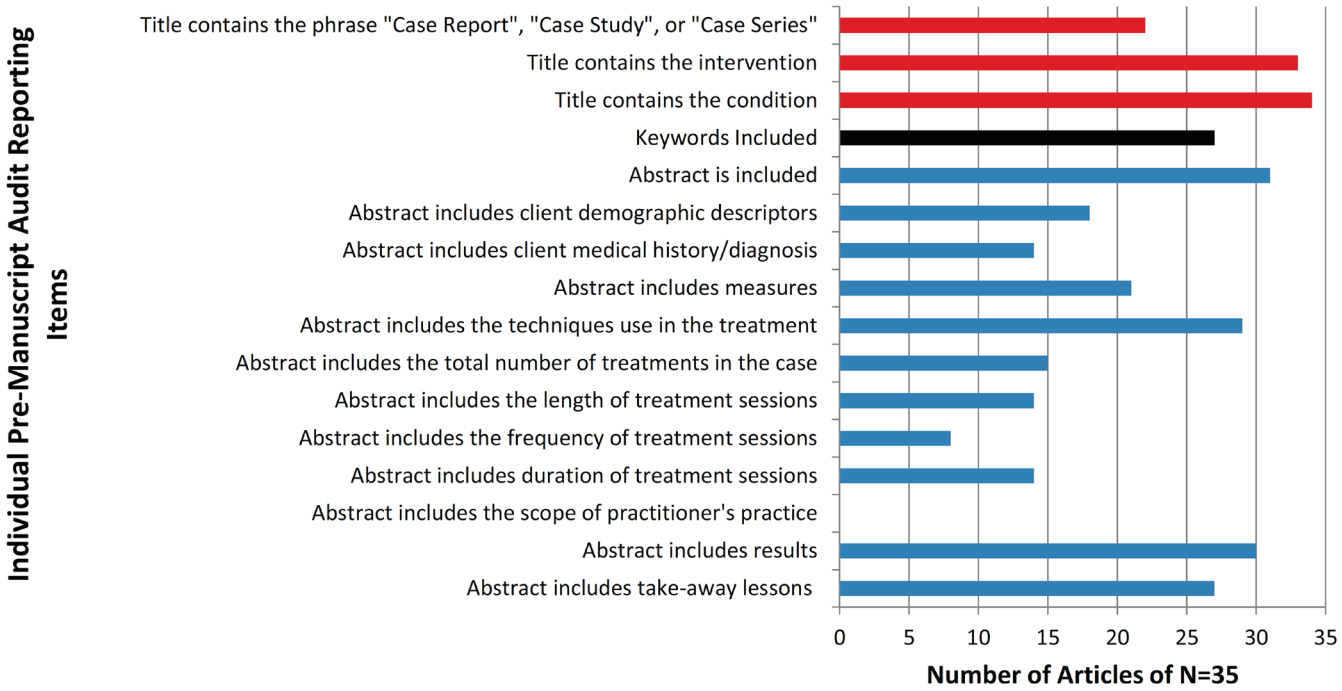

Figure 2. Frequency of premanuscript individual reporting items (N=35).

each component and subcomponent of premanuscript items and manuscript items, respectively. Frequency considerations are divided into premanuscript and manuscript items for ease of reporting and reading.

Premanuscript items (Figure 2)

Sixteen Premanuscript items were included in the audit. Audit items related to the title and keywords were consistently reported by audited articles. Specifically, 77% of the articles included keywords and titles

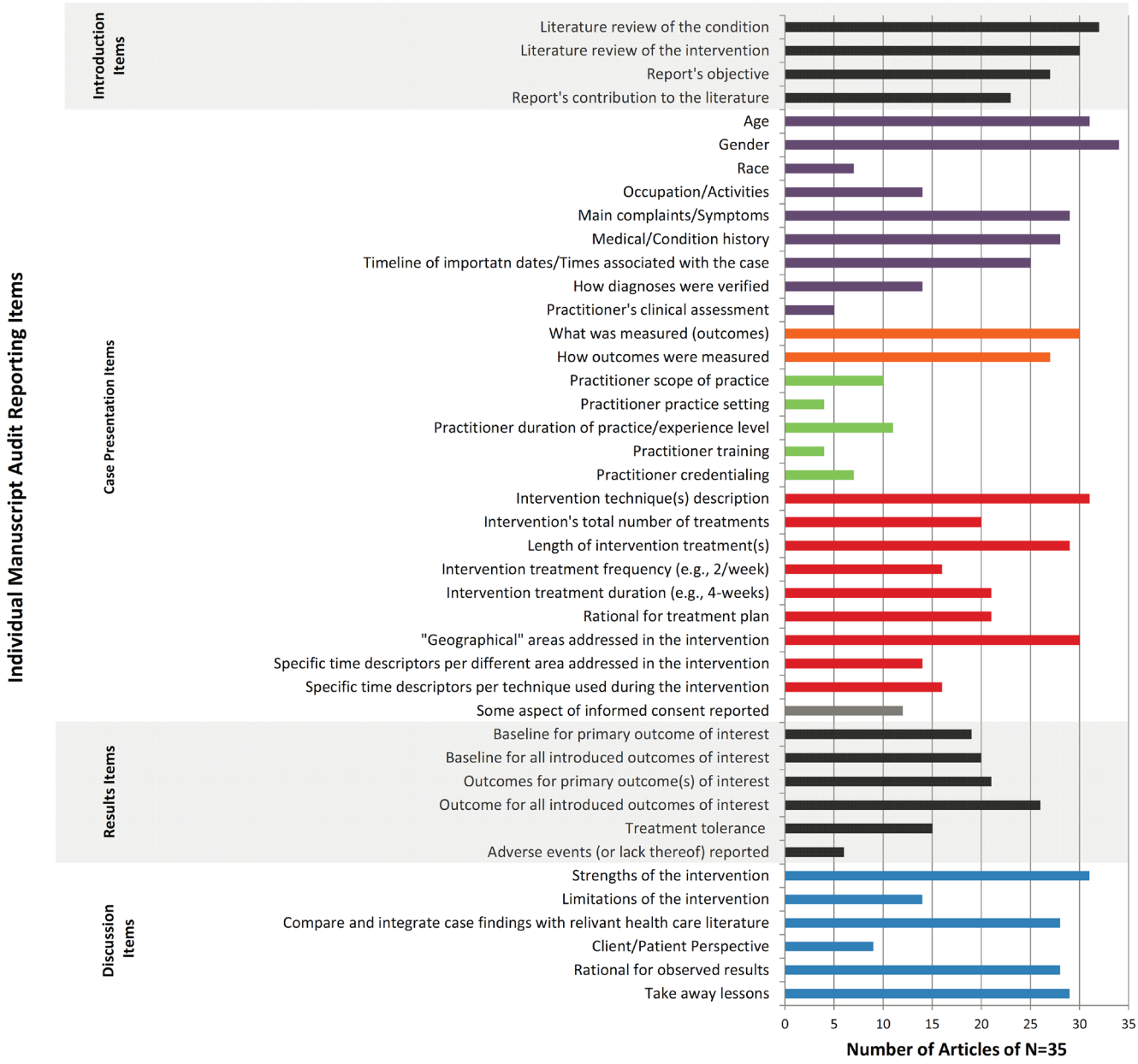

Figure 3. Frequency of manuscript individual reporting items (N=35).

contained the intervention and condition of interest in 94% and 97% of the audited articles, respectively. Sixty-three percent of audited article titles identified themselves as case reports, studies, or series. Four audited articles did not include abstracts, and related audit items for articles that did include an abstract were not reported as consistently as were the title and keywords items. No audited article abstracts specifically stated TMB practitioner scope-of-practice. Less than half of the audited articles' abstracts reported frequency (23%), length (40%), duration (40%), or total number (43%) of treatment sessions, and 60% of abstracts did not include the massage recipient's medical history/diagnosis specifically.

Manuscript items (Figure 3)

Forty-two manuscript items were included in the audit and no component or subcomponent had items consistently reported. Seventeen audit items were included in 75% or more of the audited articles such as "take-away" lessons (83%), which (86%) and how (77%) outcomes of interest were measured, client/patient main complaints/symptoms (83%) and age (89%), and literature reviews of the featured

intervention/approach (86%). Almost all audited articles included treatment recipient gender (97%) and a literature review of the conditions of interest (91%). Conversely, 14 audited items were included in 40% or less of the audited articles; many of which were client/patient (race – 20%, perspective – 26%, how diagnosis was verified – 40%, and occupation/activities – 40%) and practitioner (practice setting – 12%, training – 12%, scope-of-practice – 29%, and credentialing – 20%) related. Only 17% of audited cases reported adverse events or lack thereof, and just 34% reported some aspect of consent. While some aspects describing the intervention of focus were consistently included in audited articles (i.e., length of treatment(s) – 83%, geographical areas addressed – 86%, and technique(s) description – 89%), the consistency of others were moderate to low (i.e., treatment duration – 60%, total number of treatments – 57%, rational for treatment plan – 60%, treatment frequency – 46%, and specific time descriptors per technique – 46% and area – 40%).

DISCUSSION

Guidelines serve to facilitate thorough and transparent reporting of various types of research designs in order to help readers critically appraise the methodology and accurately interpret the application of research findings.[40] Reporting guidelines have been developed and published for randomized controlled trials (CONSORT),[41] observational studies (STROBE),[42] and systematic reviews and meta-analyses (PRISMA)[4], among others. After reporting guidelines are published, it is appropriate to assess the extent to which publications related to identified designs comply with the guidelines and many reports/reviews have investigated this for various reporting criteria.[40,43] Even with published reporting guidelines, authors' compliance to the reporting criteria is variable. For example, a 2012 Cochrane review highlighted a concern that most randomized controlled trials do not adequately report the details related to the CONSORT Statement, even after a decade of publication and journal endorsement.[40]

Case reports are important in the TMB field particularly as formalized research begins to focus more on TMB approaches. Because few TMB practitioners are academically trained to design and funded to conduct formal/complex research or are involved in formal research endeavors, case reports serve as a voice for real-world practice experiences for patients and practitioners of TMB. As such, it is important that the voice heard from TMB practice is clear; reporting all key material is an important part of that process. The CARE Guidelines and subsequent TMB-adapted CARE Guidelines serve to outline the reporting needs for case reports (medical- and TMB-related, respectively) and are relatively new. To our knowledge, no studies or reports to date have assessed case reports in relation to their reporting completion and, thus, ours is the first to establish criteria to do so. After establishing the audit criteria, we turned our attention to TMB practitioner authored case reports to implement the criteria and examine the completeness of TMB case reports prior to 2015. While our findings indicate inconsistent reporting overall, with several key items within both components and subcomponents repeatedly excluded, this information can serve to frame our discussion of the importance for the areas of a case report. Exclusions that prompt the most concern include the lack of information included in case report abstracts, practitioner- and treatment-related details, informed consent, and adverse events.

A concise yet comprehensive abstract is an essential manuscript component for several reasons. First, a thorough abstract helps identify articles that are truly relevant to a particular literature search. Many journals require structured abstracts[44] to make it easier to determine relevance and/or require that reporting guidelines be followed (for case reports, the CARE guidelines). However, structured abstracts and manuscript guidelines do not generally remind authors to report the type of the practitioner that provided the care. In many instances, the relevant scope of practice and treatment context for an intervention is clear from the scope of the journal or the nature of the intervention itself (e.g., surgery). However, TMB is used by many different disciplines in a variety of treatment contexts in which different outcomes may be considered important to report. For example, information in a case report about massage applied by a nurse in a hospital setting may have little relevance to what a typical TMB practitioner can replicate in her/his practice setting. In another example, if a lay person or medical professional searched the literature to find evidence about massage for some condition, unless otherwise noted, it may be assumed that the massage was provided as part of a physical therapist regimen instead of by a TMB professional. Our current review revealed that the license or scope of the TMB provider was not included in the abstracts of any of the case reports we audited, and less than 30% reported the practitioner scope in the manuscript itself. Knowing the context in which TMB was provided, including the discipline of the TMB provider, is critically important because it gives readers an understanding of the health care context the patient was experiencing at the time. Hence, we included it in the CARE guidelines adapted for TMB case reports.[2] A second reason for writing a thorough abstract is because many times the full paper is never read. Unfortunately, whether due to subscription fees, lack of time, and/or poor motivation, abstracts are often the only component of a manuscript that receives attention. Consequently, conveying as much information as possible is important, and especially for TMB interventions, credit for the work, and context need to be clear. A third reason

for thorough abstracts is to facilitate appropriate peer review.[44] Potential manuscript peer reviewers make decisions to review manuscripts based almost entirely from the abstract. This is another example in which a clear and articulate "voice" from a case report can assist to elevate the TMB field by attracting high quality and knowledgeable consideration of TMB practitioner work through peer review.

Related to the above discussion of thorough abstract reporting is specific reporting of practitioner descriptors in the body of the manuscript. Of all the items audited in this review, the most commonly left out components were practitioner practice setting and practitioner training (each reported in only four case reports). Similarly, practitioner credentialing was included in seven case reports and practitioner scope of practice in ten. As previously mentioned, TMB may be experienced very differently when provided by a nurse in a hospital as compared to a massage therapist in a practice setting. Furthermore, TMB practitioners provide care in a variety of settings, receive varying levels of training, and possess a range of credentials,[45,46] necessitating that these details be included in TMB case reports in order for readers to accurately picture and potentially duplicate the therapeutic context. Also instrumental in duplicating an intervention is reporting detailed descriptions of the treatment. The audit revealed that item reporting in this category varied from high to low. More effort into reporting treatment frequency and time descriptors regarding technique application and bodily areas addressed is needed.

Informed consent was one of the less-often reported items in our study even though, for the purposes of the audit, consent was broadly considered. As evident in the study's REDCap Audit Form (Supplementary Materials Appendix A), audited TMB case reports were given "credit" for including consent if: a) formal IRB review and approval was obtained or if it was reported that consent b) in general, c) to treat, d) to participate in a prospective case "project" or experiment, or e) to publish the case report, was obtained. In the CARE guidelines, Gagnier and colleagues[1] include informed consent (defined specifically as permission to publish the case report) as one of the 13 main case report inclusion items; even asserting to contact surviving family members and secure permission to publish in the event the actual subject of the case report is deceased or otherwise incapacitated or unreachable. Of the 12 articles given audit "credit" for informed consent, seven only mention consent generally without specifics, one specifically relates it to consent for treatment within practice parameters, one describes it as content to participate in a case report, three report consent to specifically publish the case report, and two cases sought formal IRB approval and collected informed consent as part of the IRB-approved protocol. Based on the intent of the CARE and TMB-adapted CARE guidelines, only five (14%) of the audited articles met this criteria. This is a somewhat challenging discussion point because the term informed consent here is in regard to permission to publish the case and is different from informed consent to participate in research or consent to treatment, as in a recent topic in the TMB literature.[47] Indeed, case reports by their very nature are interesting and/or unusual occurrences within usual practice; so in fields where standards of practice are clearly determined, systematically administered and enforced, and have universal practitioner compliance, consent to treat is a given in a case report. This is not necessarily the situation throughout the TMB field. In addition, because few practitioners immediately know/think a given care visit will result in a reportable case, case reports are most often retrospective in nature, especially in the medical field. Fear from the medical community that fewer case reports would be disseminated if written consent to publish case reports was required[48] has been assuaged,[49] and medical/integrative medicine case reporting holds itself to the required informed consent criteria.[49-51] The TMB field should hold itself to these reporting guideline standards as well. The process to obtain and provide written informed consent to publish a case report need not be arduous for the TMB practitioner author, and sample forms/templates are available from the Massage Therapy Foundation (http://www.massagetherapyfoundation.org/student-practitioner-case-report-contests/), as needed. In the event that it is impractical or impossible to obtain informed consent to publish a case report, the circumstances should be concisely stated and client anonymity must be unequivocally preserved.

The reporting of adverse events (related or unrelated negative outcomes) or lack thereof is standard in research[41,42] and the description of adverse events is a common reason case reports are written. Accordingly, the CARE and TMB-adapted CARE guidelines include adverse events as a necessary reporting item for case reports. None of the purposes of the audited case reports were to describe an adverse event specifically but, of concern is the few audited articles to include any mention of adverse events or lack thereof during the course of their case. Of the six articles that included adverse event reporting, one specifically stated no adverse events occurred, four reported and described unrelated adverse events, and two reported related adverse events (one article reported both related and unrelated adverse events). It can be argued that exclusion of the adverse event reporting item is not concerning in case reports, especially when none occurred. The nonoccurrence of adverse events in TMB cases is likely common, given the one study in which negative side effects from massage therapy treatments were specifically examined found that only 10% of their sample experienced minor discomfort (described as increased soreness, headache, bruising, or tiredness).[52] However, reporting adverse events

or the lack thereof is important for TMB case reports for at least two specific reasons. First, clearly reporting adverse events or the lack thereof fosters reporting transparency and demonstrates inquiry rigor's elevation for case reports. Second, clearly reporting adverse events or the lack thereof can serve to help counter serious safety concerns regarding TMB reported in reviews that focus primarily on incidents in which trained and credentialed TMB practitioners are not implicated.[53,54] During this study's initial search for articles, more than 40 case reports focusing on massage related adverse events were identified, none of which were written by TMB practitioners or in which TMB practitioners (when applicable) were consulted to provide treatment or other pertinent information. This is problematic because while the adverse events highlighted in these case reports may not apply to the TMB field, the perception is that the TMB field is implicated. This is a point worthy of more in-depth discussion and is the focus of our next paper related to this program of research. Ultimately though, adverse event occurrence or lack thereof needs to be included in TMB case reports. A template statement such as, "No adverse events were reported by the client during the course of this case," could be systematically used in TMB case reports and/or the relaying of negative side effects could be combined with another low reported, but important audit item, treatment tolerance.

Finally, while not included in the official audit, we have proposed that discussion of a case's outcomes and their implications for TMB research, practice, and education would provide meaningful contribution to and elevate a case report's impact on the TMB field in general.[2] It is interesting to note that, while case reports are considered among the "weakest" form of scientific evidence,[55] more than 90% of the audited articles discuss its case's implications on future research. In contrast, as a form of evidence derived from practice and reported by practitioners, only 32% of audited articles address its case's implication on TMB practice. Only a single audited case discussed its outcomes implications for TMB education. This is incredibly disappointing due to the ease in which case reports could be integrated in a meaningful way into education and influence best practices considerations for new and experienced TMB practitioners. It is our hope that improved consistency in TMB related case reporting and attention to cases' implications for TMB research, practice, and education will serve to bridge the research-education-practice gap that exists in the TMB field as an understanding and awareness of the TMB-adapted CARE guidelines grow.

Limitations

As with all studies, this audit and descriptive review has its limitations. Even though case report guidelines exist via CARE and TMB-adapted CARE, journal editorial policy via author guidelines may prohibit authors from guideline compliance,[56] potentially jeopardizing the purportedly needed 'precision, completeness, and transparency' of case reports by Gagnier and colleagues.[1] For this audit and descriptive review, we did not consider individual article audit scores compared to the case report author guidelines in place for the publishing journal at the time of article publication. Our methods and consideration do not allow us to speculate on the extent to which inconsistent reporting of necessary TMB-related case report items prior to 2015 may have been influenced by journal editorial policy, such as word limits and/or other limiting specifications (e.g., not allowing abstracts).

The intention of the current audit and descriptive report is not to devalue or criticize the work and effort of those TMB practitioner authors who published their case reports prior to 2015. On the contrary, the relatively small number of TMB practitioners who have actually undertaken and completed the rather daunting and challenging task of peer-reviewed publication reflects commendable effort and important contribution to the field as foundational practice-based evidence for the TMB field. Future TMB practitioner authored case reports will do well to refer to the pioneering TMB case reports audited in this study, along with the TMB-adapted CARE guidelines, as they prepare their work for journal submission.

CONCLUSION

This report is the first critical evaluation of all TMB practitioner authored case reports in the scientific literature prior to 2015. For this first of several planned papers coming out of the larger TMB case report review project, we focus specifically on how the audit was developed and completed, and the extent to which necessary aspects of TMB case reports are included in TMB practitioner completed case reports. Several areas of reporting deficits are highlighted in the discussion, with attempts made to encourage and justify why future TMB practitioner authors should include these items in case reports to improve their practice experience's potential impact on TMB research, education, and practice. Several additional areas of consideration can be discussed from the material we have gathered for this study specifically through the lens of asking the following questions: a) What have we as a field taught ourselves from our contributions to the scientific literature? and b) Are TMB-related case reports from other fields reflective of and/or pertinent to treatments provided by TMB practitioners and the field? Other items of focus planned for future descriptive reports highlight the various conditions that TMB practitioners have addressed in case reports and to what effect, as well as who are the subjects and authors of TMB case reports. During our systematic

identification of all case reports involving massage, we found a great many completed by practitioners from other fields with scopes-of-practice under which TMB falls (e.g., nurses, physical therapists) and physicians/researchers. Future manuscripts will examine these contributions to the literature and the extent to which they apply to, and reflect, TMB as practiced by TMB practitioners.

ACKNOWLEDGMENTS

The authors wish to acknowledge with thanks the work of David Riley and the CARE Group in development of the CARE Guidelines upon which the TMB-adapted CARE guidelines and current audit are based. We also wish to thank William Meeker for his editorial assistance and input on the final drafting of this manuscript's discussion. This work was supported in part by start-up funds provided to Dr. Munk's lab by the Indiana University School of Health and Rehabilitation Sciences, the Indiana University Graduate School Block Grant awarded to the Health Sciences Department that supported Sarah Shue in her doctoral studies, and the IUPUI Life-Health Sciences Internship Program that supported Emilee Freeland's 2014/2015 term efforts in Dr. Munk's lab.

CONFLICT OF INTEREST NOTIFICATION

The authors declare there are no conflicts of interest.

COPYRIGHT

REFERENCES

1. Gagnier JJ, Kienle G, Altman DG, Moher D, Sox H, Riley D, et al. The CARE guidelines: consensus-based clinical case report guideline development. *J Clin Epidemiol*. 2014;67(1):46–51.
2. Munk N, Boulanger K. Adaptation of the CARE guidelines for therapeutic massage and bodywork publications: efforts to improve the impact of case reports. *Int J Therapeut Massage Bodywk*. 2014;7(3):32–40.
3. Harris PA, Taylor R, Thielke R, Payne J, Gonzalez N, Conde JG. Research electronic data capture (REDCap)—a metadata-driven methodology and workflow process for providing translational research informatics support. *J Biomed Inform*. 2009;42(2):377–381.
4. Moher D, Liberati A, Tetzlaff J, Altman DG, The PRISMA Group. Preferred reporting items for systematic reviews and meta-analyses: the PRISMA statement. *J Clin Epidemiol*. 2009;62(10):1006–1012.
5. Avery RM. Massage therapy for cervical degenerative disc disease: alleviating a pain in the neck? *Int J Therapeut Massage Bodywk*. 2012;5(3):41-6.
6. Bell J. Massage therapy helps to increase range of motion, decrease pain and assist in healing a client with low back pain and sciatica symptoms. *J Bodywk Move Ther.* 2008;12(3):281–289.
7. Burke A. Zen shiatsu: a longitudinal case study measuring stress reduction in a child with autism spectrum disorder. *Int J Therapeut Massage Bodywk*. 2014;7(4):23–28.
8. Chunco R. The effects of massage on pain, stiffness, and fatigue levels associated with ankylosing spondylitis: a case study. *Int J Therapeut Massage Bodywk*. 2011;4(1):12–17.
9. Cunningham JE, Kelechi T, Sterba K, Barthelemy N, Falkowski P, Chin SH. Case report of a patient with chemotherapy-induced peripheral neuropathy treated with manual therapy (massage). *Supportive Care in Cancer*. 2011;19(9):1473–1476.
10. Davis F. Therapeutic massage provides pain relief to a client with Morton's neuroma: a case report. *Int J Therapeut Massage Bodywk*. 2012;5(2):12–19.
11. Dicks K, Rizek P. Massage therapy techniques as pain management for erythromelalgia: a case report. *Int J Therapeut Massage Bodywk*. 2010;3(4):5.
12. Eisensmith LP. Massage therapy decreases frequency and intensity of symptoms related to temporomandibular joint syndrome in one case study. *J Bodywk Move Ther.* 2007;11(3):223–230.
13. Fadzil F, Anuar HM, Ismail S, Abd Ghani N, Ahmad N. Urut Melayu, the traditional Malay massage, as a complementary rehabilitative care in postpartum stroke. *J Altern Complem Med.* 2012;18(4):415–419.
14. Farrar-Koch B. Massage therapy for survivors of abuse: a case study. *Altern Med J*. 1995;2(6):47–48.
15. Finch P, Baskwill A, Marincola F, Becker P. Changes in pedal plantar pressure variability and contact time following massage therapy: a case study of a client with diabetic neuropathy. *J Bodywk Move Ther.* 2007;11(4):295–301.
16. Fry T, Xerogeanes JW, Reeves WC. Rehabilitation of ruptured quadriceps tendon complicated by a post-operative wound infection and delayed surgical repair. *J Bodywk Move Ther.* 2005;9(2):158–165.
17. Gillespie BR. Case study in pediatric asthma: the corrective aspect of craniosacral fascial therapy. *Explore: The Journal of Science and Healing*. 2008;4(1):48–51.
18. Gillespie BR. Case study in attention-deficit/hyperactivity disorder: the corrective aspect of craniosacral fascial therapy. *Explore: The Journal of Science and Healing.* 2009;5(5):296–298.
19. Halpin S. Case report: The effects of massage therapy on lumbar spondylolisthesis. *J Bodywk Move Ther.* 2012;16(1):115–123.
20. Hamm M. Impact of massage therapy in the treatment of linked pathologies: Scoliosis, costovertebral dysfunction, and thoracic outlet syndrome. *J Bodywk Move Ther.* 2006;10(1):12–20.
21. Hanson AA. Improving mobility in a client with hypochondroplasia (dwarfism): a case report. *J Bodywk Move Ther.* 2010;14(2):172–178.
22. Harris R, Piller N. Three case studies indicating the effectiveness of manual lymph drainage on patients with primary and secondary lymphedema using objective measuring tools. *J Bodywk Move Ther.* 2003;7(4):213–221.

23. Hill R, Baskwill A. Positive effects of massage therapy on a patient with narcolepsy. *Int J Therapeut Massage Bodywk*. 2013;6(2):24–28.
24. Keller G. The effects of massage therapy after decompression and fusion surgery of the lumbar spine: a case study. *Int J Therapeut Massage Bodywk*. 2012;5(4):3–8.
25. LeBauer A, Brtalik R, Stowe K. The effect of myofascial release (MFR) on an adult with idiopathic scoliosis. *J Bodywk Move Ther.* 2008;12(4):356–363.
26. LeMoon K. Clinical reasoning in massage therapy. *Int J Therapeut Massage Bodywk*. 2008;1(1):12–18.
27. Manella C, Backus D. Gait characteristics, range of motion, and spasticity changes in response to massage in a person with incomplete spinal cord injury: case report. *Int J Therapeut Massage Bodywk*. 2011;4(1):28–39.
28. McKay E. Assessing the effectiveness of massage therapy for bilateral cleft lip reconstruction scars. *Int J Therapeut Massage Bodywk*. 2014;7(2):3–9.
29. Pierson MJ. Changes in temporomandibular joint dysfunction symptoms following massage therapy: a case report. *Int J Therapeut Massage Bodywk*. 2011;4(4):37–47.
30. Price C. Body-oriented therapy as an adjunct to psychotherapy in childhood abuse recovery: a case study. *J Bodywk Move Ther.* 2002;6(4):228–236.
31. Riou N. Massage therapy for essential tremor: quieting the mind. *J Bodywk Move Ther.* 2013;17(4):488–494.
32. Russell M. Massage therapy and restless legs syndrome. *J Bodywk Move Ther.* 2007;11(2):146–150.
33. Streit RS. NTOS symptoms and mobility: a case study on neurogenic thoracic outlet syndrome involving massage therapy. *J Bodywk Move Ther.* 2014;18(1):42–48.
34. Thomason MJ, Moyer CA. Massage therapy for Lyme disease symptoms: a prospective case study. *Int J Therapeut Massage Bodywk*. 2012;5(4):9–14.
35. Wakefield ML. Case report: the effects of massage therapy on a woman with thoracic outlet syndrome. *Int J Therapeut Massage Bodywk*. 2014;7(4):7–14.
36. Warpenburg MJ. Deep friction massage in treatment of radiation-induced fibrosis: rehabilitative care for breast cancer survivors. *Integr Med*. 2014;13(5):32–36.
37. Welch SE, Bunin J. Glove use and the HIV positive massage therapy client. *J Bodywk Move Ther.* 2010;14(1):35–39.
38. Whisler SL, Lang DM, Armstrong M, Vickers J, Qualls C, Feldman JS. Effects of myofascial release and other advanced myofascial therapies on children with cerebral palsy: six case reports. *Explore: The Journal of Science and Healing.* 2012;8(3):199–205.
39. Zalta J. Massage therapy protocol for post-anterior cruciate ligament reconstruction patellofemoral pain syndrome: a case report. *Int J Therapeut Massage Bodywk*. 2008;1(2):11–21.
40. Turner L, Shamseer L, Altman DG, Weeks L, Peters J, Kober T, et al. Consolidated standards of reporting trials (CONSORT) and the completeness of reporting of randomised controlled trials (RCTs) published in medical journals. *Cochrane Database Syst Rev*. 2012;11(11).
41. Moher D, Hopewell S, Schulz KF, Montori V, Gøtzsche PC, Devereaux PJ, et al. CONSORT 2010 Explanation and Elaboration: updated guidelines for reporting parallel group randomised trials. J Clin Epidemiol. 2010;63(8):e1–e37.
42. Vandenbroucke JP, Von Elm E, Altman DG, Gøtzsche PC, Mulrow CD, Pocock SJ, et al. Strengthening the reporting of observational studies in epidemiology (STROBE): explanation and elaboration. *Ann Intern Med*. 2007;147(8):W-163–W-94.
43. Stevens A, Shamseer L, Weinstein E, Yazdi F, Turner L, Thielman J, et al. Relation of completeness of reporting of health research to journals' endorsement of reporting guidelines: systematic review. *BMJ*. 2014;348. doi:http://dx.doi.org/10.1136/bmj.g3804
44. Nakayama T, Hirai N, Yamazaki S, Naito M. Adoption of structured abstracts by general medical journals and format for a structured abstract. *J Med Library Assoc*. 2005;93(2):237–342.
45. Boulanger K, Campo S. Are personal characteristics of massage therapists associated with their clinical, educational, and interpersonal behaviors? *Int J Therapeut Massage Bodywk*. 2013;6(3):25–34.
46. Porcino AJ, Boon HS, Page SA, Verhoef MJ. Exploring the nature of therapeutic massage bodywork practice. *Int J Therapeut Massage Bodywk*. 2013;6(1):15.
47. Porcino AJ, Page SA, Boon HS, Verhoef MJ. Negotiating consent: exploring ethical issues when therapeutic massage bodywork practitioners are trained in multiple therapies. *Int J Therapeut Massage Bodywk*. 2014;7(4):15–22.
48. Wilkinson G, Fahy T, Russell G, Healy D, Marks I, Tantam D, et al. Case reports and confidentiality. Opinion is sought, medical and legal. *Br J Psychiat.* 1995;166(5):555–558.
49. Nissen T, Wynn R. The clinical case report: a review of its merits and limitations. *BMC Res Notes*. 2014;7:264.
50. Bavdekar SB, Save S. Writing case reports: contributing to practice and research. *J Assoc Physicians India*. 2015;63.
51. Wardle J, Roseen E. Integrative medicine case reports: a clinicians' guide to publication. *Advance Integr Med*. 2014;1(3):144–147.
52. Cambron JA, Dexheimer J, Coe P, Swenson R. Side-effects of massage therapy: a cross-sectional study of 100 clients. *J Altern Complem Med.* 2007;13(8):793–796.
53. Ernst E. The safety of massage therapy. *Rheumatol*. 2003;42(9):1101–1106.
54. Posadzki P, Ernst E. The safety of massage therapy: an update of a systematic review. *Focus Altern Complem Ther*. 2013;18(1):27–32.
55. Rosner AL. Evidence-based medicine: revisiting the pyramid of priorities. *J Bodywk Move Ther.* 2012;16(1):42–49.
56. Miguel D, Elsner P. Author guidelines in dermatological journals discourage the use of the CAse REport guidelines. *Br J Dermatol*. 2015;173(4):1107–1108.

Corresponding author: Niki Munk, PhD, LMT School of Health and Rehabilitation Sciences, Indiana University – IUPUI, 1140 West Michigan Street, CF 120, Indianapolis, IN 46202, USA

E-mail: nmunk@iu.edu