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"Spin" in Observational Studies in Deep Inferior Epigastric Perforator Flap Breast Reconstruction: A Systematic Review

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Background: The deep inferior epigastric artery perforator (DIEP) flap is widely used in autologous breast reconstruction. However, the technique relies heavily on nonrandomized observational research, which has been found to have high risk of bias. "Spin" can be used to inappropriately present study findings to exaggerate benefits or minimize harms. The primary objective was to assess the prevalence of spin in nonrandomized observational studies on DIEP reconstruction. The secondary objectives were to determine the prevalence of each spin category and strategy.
Methods: MEDLINE and Embase databases were searched from January 1, 2015, to November 15, 2022. Spin was assessed in abstracts and full-texts of included studies according to criteria proposed by Lazarus et al.
Results: There were 77 studies included for review. The overall prevalence of spin was 87.0%. Studies used a median of two spin strategies (interquartile range: 1–3). The most common strategies identified were causal language or claims (n = 41/77, 53.2%), inadequate extrapolation to larger population, intervention, or outcome (n = 27/77, 35.1%), inadequate implication for clinical practice (n = 25/77, 32.5%), use of linguistic spin (n = 22/77, 28.6%), and no consideration of the limitations (n = 21/77, 27.3%). There were no significant associations between selected study characteristics and the presence of spin.
Conclusions: The prevalence of spin is high in nonrandomized observational studies on DIEP reconstruction. Causal language or claims are the most common strategy. Investigators, reviewers, and readers should familiarize themselves with spin strategies to avoid misinterpretation of research in DIEP reconstruction.
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INTRODUCTION

Breast reconstruction after mastectomy in breast cancer patients is known to provide significant improvements in psychological well-being.[1] Among various techniques available, the deep inferior epigastric perforator (DIEP) flap is considered to be the gold standard for autologous breast reconstruction.[2] Despite the clinical importance and high regard of the DIEP flap technique, most research studies in leading plastic surgery journals are nonrandomized and observational in nature.[3] Nonrandomized observational studies on DIEP flap breast reconstruction have shown high risk of bias in their methodology.[2]

Nonrandomized observational studies are generally considered to be of lesser quality evidence compared with randomized controlled trials (RCT) and systematic reviews/meta-analyses of RCTs. Nonetheless, observational studies are commonplace in plastic surgery. The prevalence of observational research, in part, is due to being less resource intensive and easier to conduct.[4] Other

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factors, such as difficulties with blinding and surgeon differences, make RCTs especially challenging to conduct in surgical research.[5] RCTs in breast reconstruction in particular are also known for difficulties in patient recruitment.[6] As a result, observational studies play an important role in surgical literature and clinical decision-making in the absence of higher-quality evidence. Therefore, it is important that observational studies not only minimize bias in their methodologies, but also in their reporting of data.

"Spin" refers to the inappropriate presentation of study findings to overstate the benefits or understate the harms to a reader. Spin may occur intentionally to portray data in a positive light or can occur unintentionally due to misuse of language.[7] Studies have been found to frequently report and interpret their findings in a way that distracts readers from statistically nonsignificant primary outcomes.[8] Previous investigations of spin in the abstracts of both RCTs and systematic reviews/meta-analyses in plastic surgery have shown a high prevalence of spin.[9,10]

The primary objective of this study was to determine the prevalence of spin in nonrandomized observational studies about DIEP breast reconstruction. The secondary objectives were to determine the prevalence of each spin category and strategy.

Takeaways

Question: What is the prevalence of "spin" (inappropriate presentation of study findings) in observational studies on deep inferior epigastric artery perforator flaps?

Findings: Of the 77 studies identified, 87% of studies utilized at least one spin strategy. The most common strategy was the use of inappropriate causal language or claims.

Meaning: The prevalence of spin in observational deep inferior epigastric artery perforator flap research is high; investigators, reviewers, and readers should familiarize themselves with the strategies to avoid misrepresentation and misinterpretation of study findings.

METHODS

This systematic review was conducted according to the Preferred Reporting Items for Systematic Reviews and Meta-analysis statement.[11] (**See appendix, Supplementary Digital Content 1,** which displays PRISMA checklist. **http://links.lww.com/PRSGO/C634**.) The protocol was registered a priori (https://osf.io/9cx65/).

Search Strategy

A comprehensive literature search of MEDLINE and Embase was performed to identify all nonrandomized observational studies published from January 1, 2015 to November 15, 2022, using key terms that pertain to DIEP flap breast reconstruction. (**See appendix, Supplementary Digital Content 2,** which displays the search strategy. **http://links.lww.com/PRSGO/C635**.) Studies identified by the search strategy were uploaded to Covidence software for systematic reviews (Veritas Health Innovation Ltd.). Two authors (M.Y. and J.W.) independently screened title and abstract to assess eligibility to move onto subsequent analysis. Any studies where the information available in the title and abstract were insufficient to determine eligibility were reviewed at full-text screening. The same two authors then screened studies for final inclusion at full-text level. All discrepancies throughout the two-stage screening process were resolved through consensus between the two reviewers, and the senior author as necessary. A preliminary screening was performed of 10% of the studies to ensure agreement between reviewers.

Eligibility Criteria

Articles with a particular focus on DIEP flap breast reconstruction that are identified as nonrandomized observational studies were included for analysis. Only studies with patient-reported or clinical outcomes were included. Only studies that focus on a therapeutic intervention with a comparator intervention were included. The spin criteria outlined by Lazarus et al were designed for use with comparative studies, and many of the strategies are not applicable for noncomparative studies.[7] For example, a retrospective cohort study by Yang et al was excluded because there are no interventions being compared.[12] Studies that are non-English literature, nonhuman based studies, RCT, case series, case studies, systematic reviews, and other study designs (narrative reviews, expert opinions, editorials, protocols, conference abstracts) were excluded.

Data Collection

The use of "spin" was assessed using the criteria outlined by Lazarus et al[7] in both abstract and full-text of included studies. This set of criteria has three categories (misleading reporting, inadequate interpretation, inadequate extrapolation) with different strategies in each category (Table 1). The level of spin in conclusions is determined according to the following criteria. Studies with low spin report with uncertainty in the framing or recommendations for further trials. Studies with moderate spin report with some uncertainty in the framing or recommendations for further trials. Studies with high spin reported without uncertainty or recommendations for further trials.

Two review authors (P.K. and M.Y.) independently assessed spin and other study characteristics for each study. Any discrepancies were resolved through consensus, and the senior author as necessary. Study characteristics were extracted, including authors, journal, year of publication, impact factor, number of citations, country affiliation of corresponding author, sample size, and significant primary outcome.

Quality Assessment

Quality of included studies was assessed by two review authors (P.K. and M.Y.) independently in duplicate, using the Risk of Bias in Non-randomised Studies of Interventions (ROBINS-I) tool.[13] Any discrepancies were resolved through consensus, and by the senior author as

Table 1. Spin Classification for Nonrandomized Studies Assessing Therapeutic Interventions Defined by Lazarus et al[7]

Category of Spin	Strategy Used	Definition
Misleading reporting	Not reporting adverse events or lack of focus on harm	Results are reported without warnings on important or relevant safety issues
	Selective reporting	Only a subset of the original outcomes or analysis planned in a study is fully reported
	Misleading description of study design	Study design is presented as more robust than it actually is
	Use of linguistic spin	Any word or expression emphasizing the beneficial effect of the therapeutic intervention
	No consideration of the limitations	Important limitations are not taken into account in the interpretation of the results
	Selective citation of other studies	Only previous studies concordant with the current study findings are acknowledged or other important studies in the field are not reported
Inadequate interpretation	Claim an effect for nonstatistically significant results	Therapeutic intervention is presented as effective despite a nonstatistically significant result
	Claim an equivalence for nonstatistically significant results despite a wide confidence interval	Therapeutic intervention and comparator are presented as equivalent when a comparison test is not statistically significant with a large confidence interval
	Ruling out safety for nonstatistically significant results	Therapeutic intervention is presented as safe based on a nonstatistically significant comparison test, despite a large confidence interval
	Causal language or causal claim	Results are presented with a sentence implying a cause-and-effect link between the intervention and the outcome
	Claim of any significant difference despite lack of statistical test	Therapeutic intervention and comparator are compared despite no proper statistical test reported
	Focus on statistical significance instead of clinical relevance	Results are presented by their statistical significance without considering the clinical relevance of the effect size
Inadequate extrapolation	Inadequate extrapolation to larger population, intervention or outcome	Results are generalized to another population, intervention or outcome than those of the study (such as surrogate outcomes)
	Inadequate implication for clinical practice	Authors recommend the use of therapeutic intervention for clinical practice
	Other	Evidence of spin not classified under other criteria

necessary. A visualization of the ROBINS-I assessment was made using the robvis tool.[14]

Statistical Analysis

Descriptive statistics were used to present study characteristics and spin. Characteristics of spin identified in the review were described qualitatively. To evaluate study characteristics associated with the presence of spin, chi-square (ie, categorical variables), linear by linear association (ie, ordinal variables), and simple univariate logistic regression (ie, continuous variables) were performed. Independent variables (publication year, impact factor, citations per year, single- versus multisurgeon studies, and ROBINS-I assessment) were chosen based on hypothesized association with spin. Statistical significance was determined as a P value less than 0.05. All analyses were performed with SPSS, version 25.0 (IBM Corporation, Armonk, N.Y.).

RESULTS

The search identified 13,416 studies, of which there were 77 studies included for review (Fig. 1).[15–91] A list of all included studies is available in Supplemental Digital Content 3. (**See table, Supplementary Digital Content 3**, which displays characteristics and references of all included studies. **http://links.lww.com/PRSGO/C636**.)

Study characteristics are summarized in Table 2. Common journals among included studies are the *Journal of Plastic, Reconstructive, and Aesthetic Surgery* (n = 19/77, 24.7%) and *Plastic and Reconstructive Surgery* (n = 17/77, 22.1%). Studies were published in journals with a median impact factor of 2.8 (interquartile range [IQR] 2.7–4.7). Studies had a median of three citations per year (IQR 1.5–4.9).

The majority of included studies were retrospective cohort studies (n = 56/77, 72.7%). Most studies did not receive any funding (85.7%, n = 66/77). The median sample size was 137 patients (IQR 61–331). There were multiple surgeons involved in 83.1% (n = 64/77) of studies; 16.9% (n = 13/77) were single-surgeon experiences. At least one spin strategy was identified in 87.0% (n = 67/77) of studies. Studies used a median of two (IQR 1–3) spin strategies, up to a maximum of seven.

Most studies did not self-report level of evidence (79.2%, n = 61/77). Based on the ROBINS-I tool, 11.7% (n = 9/77) of studies had critical risk of bias; 39.0% (n = 30/77), serious; 16.9% (n = 13/77), moderate; 2.6% (n = 2/77), low; and 29.9% (n = 23/77) of studies did not have enough information to assess risk of bias. A full breakdown of risk of bias by domain is available in Supplemental Digital Content 4. (**See table, Supplemental Digital Content 4**, which displays ROBINS-I assessment of included studies. **http://links.lww.com/PRSGO/C637**.)

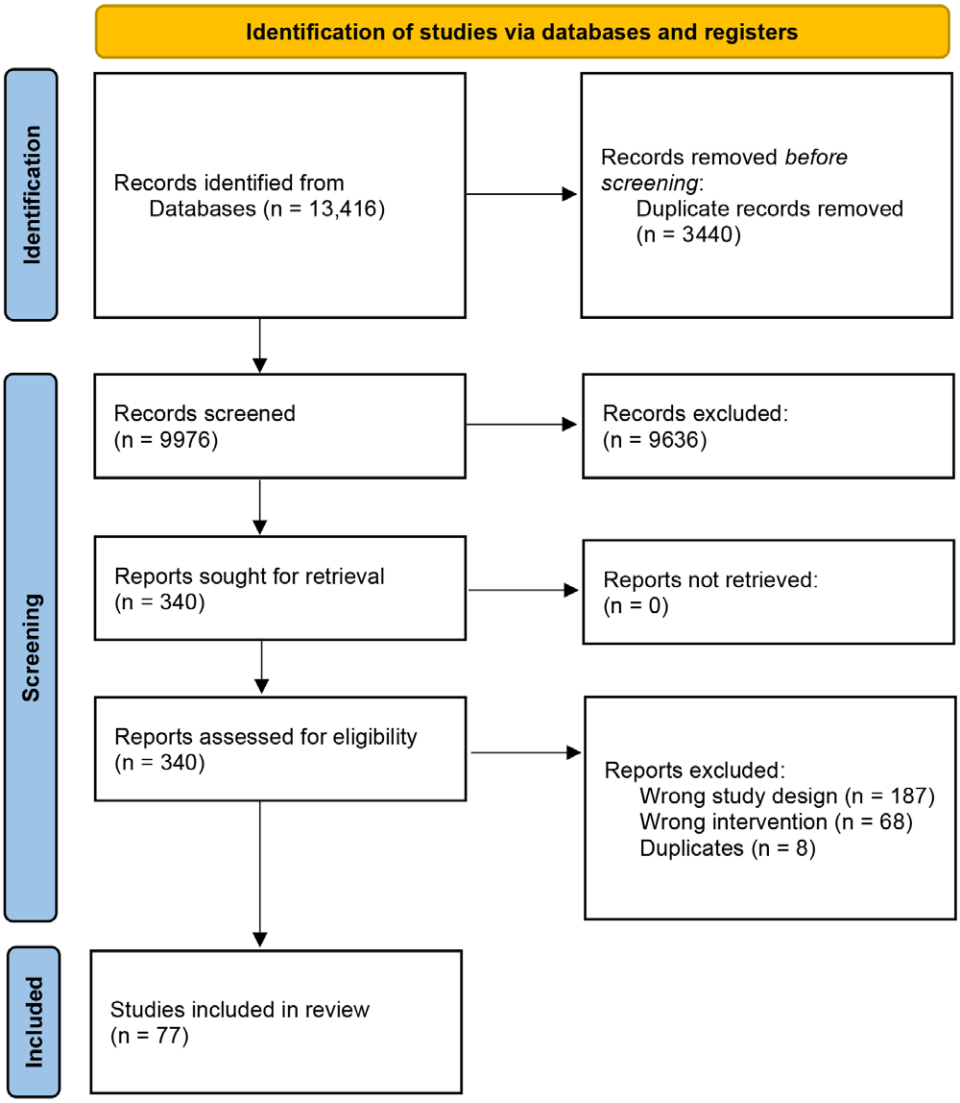

Fig. 1. Preferred Reporting Items for Systematic Reviews and Meta-analysis statement (PRISMA) diagram for study inclusion.

Misleading of Reporting

The most common spin strategy that utilized misleading of reporting was "use of linguistic spin" (n = 22/77, 28.6%). One use of linguistic spin was the suggestion of a treatment effect despite the statistical nonsignificance. For example, a retrospective review comparing fat-augmented latissimus dorsi flaps and DIEP flaps stated that "overall satisfaction scores were found slightly higher, but not statistically significant, in the free-flap group ($P = 0.442$)."[50] Another common use of linguistic spin was through rhetorical manipulations such as "the skin sparing mastectomy combined with immediate reconstruction by DIEAP-flap provides an excellent therapeutic option for patients."[55]

Another common strategy in this category was "no consideration of the limitations" (n = 21/77, 27.3%). Most studies using this strategy were found to have no limitations stated in either the abstract or the article, despite small sample sizes, retrospective design, and/or significant between-group differences in baseline characteristics. Other spin strategies identified were not reporting adverse events or lack of focus on harm (n = 10/77, 13.0%), selective reporting (n = 9/77, 11.7%), and misleading description of study design (n = 2/77, 2.6%). Examples of all misleading of reporting strategies are available in Table 3.

Inadequate Interpretation

In the "inadequate interpretation" category, the most commonly identified strategy was "causal language or claim" (n = 41/77, 53.2%) despite the limitations of nonrandomized study design, which was also the most common strategy overall. For example, in a retrospective study comparing one-side recipient vessel bilateral DIEP flaps in 19 patients with two-side recipient bilateral DIEP vessel flaps in six patients, the abstract conclusion stated "utilizing [one-side recipient vessels] can reduce

Table 2. Study Characteristics

Description	n/N (%)
Total	77
Journal	
Journal of Plastic, Reconstructive, and Aesthetic Surgery	19/77 (24.7%)
Plastic and Reconstructive Surgery	17/77 (22.1%)
Journal of Reconstructive Microsurgery	8/77 (10.4%)
Annals of Plastic Surgery	7/77 (9.1%)
Microsurgery	6/77 (7.8%)
Other	20/77 (26.0%)
Journal impact factor (median [IQR])	2.8 (2.7–4.7)
Number of citations per year (median [IQR])	3 (1.5–4.9)
Year of publication	
2015	10/77 (13.0%)
2016	14/77 (18.2%)
2017	6/77 (7.8%)
2018	9/77 (11.7%)
2019	4/77 (5.2%)
2020	10/77 (13.0%)
2021	14/77 (18.2%)
2022	10/77 (13.0%)
Study design	
Prospective cohort	17/77 (22.1%)
Retrospective cohort	56/77 (72.7%)
Cross-sectional	4/77 (5.2%)
Level of evidence (self-reported)	
4	2/77 (2.6%)
3	13/77 (16.9%)
2	1/77 (1.3%)
Not reported	61/77 (79.2%)
Funding sources	
None	66/77 (85.7%)
Government	2/77 (2.6%)
Charitable organization	2/77 (2.6%)
Not reported	7/77 (9.1%)
Surgeon experience	
Single surgeon	13/77 (16.9%)
Multiple surgeons	64/77 (83.1%)
Sample size (median [IQR])	137 (61–331)
Number of spin strategies (median [IQR])	2 (1–3)
0	11/77 (14.3%)
1	21/77 (27.3%)
2	17/77 (22.1%)
3	9/77 (11.7%)
4	7/77 (9.1%)
5	5/77 (6.5%)
6	6/77 (7.8%)
1	7/77 (9.1%)

the ischemia time and spare one side internal mammary vessels."[53] Another retrospective study, which compared 53 patients with semiabsorbable mesh and 32 patients without, claimed "…semi-absorbable mesh in a subfascial fashion reduces hernia formation without diminishing rectus abdominis muscle integrity or function…"[26]

There were 11.7% (n = 9/77) of studies that claimed an effect for nonstatistically significant results, 9.1% (n = 7/77) that focused on statistical significance instead of clinical relevance, 2.6% (n = 2/77) that ruled out safety for nonstatistically significant results, and 2.6% (n = 2/77) that claimed a significant difference despite the lack of a statistical test. No studies claimed equivalence for nonsignificant findings despite wide CIs. An example of the aforementioned strategies is available in Table 4.[92]

Inadequate Extrapolation

Inadequate extrapolation to larger population, intervention, or outcome were identified in 35.1% (n = 27/77) of studies. For example, a prospective study comparing transverse rectus abdominus muscle flaps and DIEP flaps concluded that "the surgeon can intraoperatively choose to perform a muscle-sparing free transverse rectus abdominus muscle flap instead of a DIEP flap based on intraoperative anatomical findings without hesitation or concern with regard to postoperative abdominal morbidity" despite excluding patients with vascular or wound healing comorbidities.[76] In a retrospective study comparing superior gluteal artery perforator flaps with DIEP flaps, the study conclusion stated, "when carefully performed, excellent aesthetic outcomes can reliably be reproduced [with the superior gluteal artery perforator flap]" despite not evaluating aesthetics as a study outcome.[67]

Many studies also made inadequate implications for clinical practice (n = 25/77, 32.5%). We identified a study concluding that "…cannula-assisted, limited undermining, and progressive high-tension suture [CALP] should be always preferred to standard abdominoplasty for DIEP donor-site closure…" despite being of retrospective design, conducted by a single surgeon at a single center, and containing 55 patients in the CALP group.[74] We present more examples of inadequate extrapolation in Table 5.

Level of Spin in Conclusions

There was a high level of spin in the conclusions of 67.5% (n = 52/77) of studies. The level of spin was moderate in 19.4% (n = 15/77), and low in 5.2% (n = 4/77) of study conclusions. Only 3.9% (n = 3/77) of conclusions had no spin. Spin in conclusions was commonly due to causal language, leading to decreased uncertainty in the framing of study findings. Studies also rarely recommended further investigations to confirm their findings.

Associations

There were no significant associations identified between the presence of spin and publication year [$P = 0.690$; $\beta = 0.053$; odds ratio (OR), 1.055; 95% confidence interval (CI), 0.812–1.371], journal impact factor ($P = 0.293$; $\beta = 0.316$; OR, 1.371; 95% CI, 0.761–2.470), or number of citations per year ($P = 0.347$; $\beta = -0.081$; OR, 0.922; 95% CI, 0.778–1.092). There were also no associations between presence of spin and single- versus multisurgeon experiences ($\chi^2 = 0.555$, $P = 0.456$) or ROBINS-I ($\chi^2 = 0.027$, $P = 0.869$).

DISCUSSION

The present review examined the prevalence and features of spin in nonrandomized observational studies on DIEP reconstruction. Across 77 studies that were analyzed, 87.0% of studies were found to have some form of spin.

Table 3. Misleading of Reporting in Nonrandomized Observational Studies in DIEP Flap Breast Reconstruction

Strategy	n/N (%)	Example
Not reporting adverse events or lack of focus on harm	10/77 (13.0%)	*"There were no flap-related complications."* The abstract says the above despite reporting numerous flap-related complications in the full-text. Although there were no statistically significant differences between groups, the intraoperative dopamine infusion (intervention) group had the following complications: re-operation (9), fat necrosis (8), hematoma (4), venous congestion (3), flap loss (1), and infection (1).
Selective reporting	9/77 (11.7%)	*"When questioned about their satisfaction with breasts and satisfaction with outcome, all three procedures were rated similarly high. When comparing the physical well-being of the donor site and appearance of the donor site, LAP flap patients reported significantly lower scores than DIEP and SGAP flap patients."* The abstract only reports scores for four out of eight scales on the BREAST-Q questionnaire. For example, the SGAP flap patients reported significantly lower scores in psychosocial well-being and sexual well-being, but this was not mentioned.
Misleading description of study design	2/77 (2.6%)	*"This is a retrospective cohort study carried out using the patients of two plastic surgery departments who have undergone monolateral or bilateral implant-based or DIEP flap breast reconstruction."* This was primarily a cross-sectional study based on the BREAST-Q questionnaire.
Use of linguistic spin	22/77 (28.6%)	*"Among the flaps we evaluated, the DIEP flap remains the most reliable flap for microvascular breast reconstruction, with excellent results and limited donor site morbidity,"* The authors utilize "excellent results" as a rhetorical manipulation to inflate the findings without formally assessing the results for their "excellence."
No consideration of the limitations	21/77 (27.3%)	*"There is no increased risk in breast cancer recurrence after delayed DIEP flap reconstruction compared with mastectomy alone."* Although the groups were matched for certain variables (year/age of diagnosis, type of cancer, demographic region), they were not matched for cancer staging or treatment. Groups would also likely have been underpowered to come to such a conclusion.
Selective citation of other studies	0/77 (0.0%)	Not assessed, as the types of observational studies evaluated here would lead to subjective criteria as to whether citations were selective.

Table 4. Inadequate Interpretation in Nonrandomized Observational Studies in DIEP Flap Breast Reconstruction

Strategy	n/N (%)	Example
Claim an effect for nonstatistically significant results	9/77 (11.7%)	*"Patients in the quilting group also showed a reduction in mean duration of hospital stay."* Hospital stay was decreased by 0.6 days and was not statistically significant.
Claim an equivalence for nonstatistically significant results despite a wide confidence interval	0/77 (0.0%)	NA
Ruling out safety for nonstatistically significant results	2/77 (2.6%)	*"From these results, we propose that the surgeon can select the muscle-sparing free TRAM flap, without hesitation or concern regarding abdominal morbidity…"* The study evaluated abdominal function using an isokinetic dynameter. The study found that both groups recovered to preoperative levels at 6 months with no statistically significant differences, leading to the claim made above. However, abdominal function was found to be lower in the TRAM group at 3 months postoperatively and there was a patient with severe bulging in the TRAM group requiring reoperation, while the DIEP group had no abdominal complications requiring reoperation.
Causal language or causal claim	41/77 (53.2%)	*"An enhanced recovery after surgery protocol contributes an accelerated postoperative recovery of patients undergoing a DIEP flap breast reconstruction."* The authors suggest a causational effect of the protocol despite the limitations of observational study design.
Claim of any significant difference despite lack of statistical test	2/77 (2.6%)	*"Our patients in the fibrin glue group had earlier hospital discharge after abdominal drain removal."* No statistical test reported for discharge after drain removal.
Focus on statistical significance instead of clinical relevance	7/77 (9.1%)	*"Moreover, the results of this study demonstrates a significant decrease in patient-reported pain scores and adverse health issues."* Differences in pain scores were 2.19 versus 1.46 in the evening and 2.17 versus 1.73 during admission. The MCID for postoperative pain has been found to be 1 point and anything under 3.3 is acceptable pain control.[17]

Table 5. Inadequate Extrapolation in Nonrandomized Observational Studies in DIEP Flap Breast Reconstruction

Strategy	n/N (%)	Example
Inadequate extrapolation to larger population, intervention, or outcome	27/77 (35.1%)	*"According to the authors' experience, cannula-assisted, limited undermining, and progressive high-tension suture should be always preferred to standard abdominoplasty for DIEP donor-site closure to reduce the complication rate to improve abdominal skin sensitivity and scar quality."* This study's population included a wide BMI range but had no smokers nor other risk factors such as diabetes or hypertension. As such, this subjective comment is not necessarily supported by empiric evidence and may not be advisable toward the general population.
Inadequate implication for clinical practice	25/77 (32.5%)	*"We advise the use of a 'dual-plane' DIEP flap in all cases in which a single perforator flap is anatomically feasible and desired, but there is a need for moderate additional arterial and venous flow augmentation."* This was a retrospective study with an experimental group of 15 patients.

These findings are in line with other studies assessing spin. In the review by Lazarus et al, which examined abstracts of nonrandomized studies across a broad scope of medical topics, the prevalence of spin in their review was 84%.[7] In a review of spin in abstracts of systematic reviews and meta-analyses in plastic surgery, Gallo et al reported a spin prevalence of 73%.[9]

In 2008, only 40 of the top 1000 most cited articles in plastic surgery journals were of randomized design.[93] Although progress is being made in evidence-based plastic surgery, RCTs continue to be rare in plastic surgery due to a variety of cited barriers, such as difficulty with randomization, differences in surgeon experience, lack of funding and resources, etc.[93,94] Thus, there is a reliance on nonrandomized, observational research to inform clinical practice. When conducted and reported properly, nonrandomized observational studies can provide valuable evidence to support the usefulness of an intervention. They are easier to conduct, which is both financially advantageous and allows for longer follow-up. Selection criteria can also be more representative of a true population in contrast to RCTs that tend toward stricter eligibility.[95]

To conduct high-quality nonrandomized research, investigators should be aware of the strengths and limitations of this study design. In the absence of randomization, there is risk of selection bias in determining who receives which intervention. Confounders can muddle the associations between interventions and outcomes.[95] Nonrandomized research is fundamentally limited in that it can only identify associations between interventions and outcomes, not any causal relationships.[7] However, in our review, the most common spin strategy was causal language or claims (53.2%), and many studies (27.3%) failed to consider limitations with respect to their specific study and/or those inherent to the nonrandomized study design.

Our review also found a high prevalence of inadequate extrapolations to larger populations, interventions, or outcomes (35.1%) and inadequate implications for clinical practice (32.5%). These findings are in contrast to the review by Lazarus et al, which only identified inadequate extrapolation in 8.6% and inadequate implications for clinical practice in 19.5% of studies.[7] In particular, studies examined in our review frequently made recommendations for the implementation of their interventions in clinical practice. The overall level of spin in the conclusions was high in 67.5% of studies.

A potential explanation is that in plastic surgery research, technical innovations may be highly valued over validation studies.[93] Although the DIEP flap is now established and widely used in autologous reconstruction, innovations continue to be proposed in terms of technical approach, recovery protocols, and alternative donor sites.[18,30,45] Consequently, investigators may be biased in the presentation of their research similar to how industry-funded investigators are subject to conflicts of interest. This is particularly concerning when considering the high risk of bias found in nonrandomized studies of DIEP reconstruction.[2] By making extrapolations with low validity data, investigators risk inappropriately influencing clinical decision-making.

There were limitations to our review. The evaluation of spin was conducted using subjective criteria, which is subject to personal biases of the authors. We attempted to mitigate this by evaluating the studies in duplicate. There may also be spin strategies within our studies that were not accounted for by the criteria developed by Lazarus et al.[7] Furthermore, the criteria could not assess intent; thus, we cannot comment on whether spin was used deliberately to mislead readers. Despite these limitations, this review was able to describe spin in nonrandomized observational studies on DIEP reconstruction.

CONCLUSIONS

In plastic surgery research, financial and logistical barriers make higher-level research such as RCTs difficult to conduct. Consequently, the field relies heavily on observational studies like the ones identified in our review. Therefore, it is paramount that these studies are held to a high degree of methodological rigor to accurately inform clinicians and investigators.

There is a high prevalence of spin in nonrandomized observational studies on DIEP reconstruction. Causal language or claims are the most common strategy. We recommend that readers be cognizant of various forms of spin and critically assess the presentation of study findings, prior to implementing ideas into their clinical practice or informing future research directions. Investigators should familiarize themselves with the spin strategies to appraise their own research before journal submission. Journal reviewers and editors should familiarize themselves with the limitations of observational research to prevent the publication of unfounded recommendations.

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DISCLOSURE

The authors have no financial interest to declare in relation to the content of this article.

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