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Insights Into the Safety and Efficacy of Chemical Peels in Treating Acanthosis Nigricans – a Systematic Review of Clinical Studies and Randomised Controlled Trials

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Systematic Review

Keywords: Acanthosis nigricans, chemical peels, trichloroacetic acid, glycolic acid, fractional CO2 laser, microneedling, post-inflammatory hyperpigmentation

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Abstract

Background: Acanthosis nigricans (AN) is a dermatological condition characterised by hyperpigmented, velvety, thickened skin, primarily affecting intertriginous areas such as the neck, axillae, and groin. It is strongly associated with insulin resistance, obesity, metabolic syndrome, and, in rare cases, malignancies. Various treatment modalities, including chemical peels, fractional CO2 laser, and microneedling, have been explored to improve the cosmetic appearance of affected skin. However, no definitive consensus on treatment exists.

Objective: This systematic review aims to evaluate and compare the efficacy of chemical peels like Trichloroacetic acid (TCA), Glycolic acid (GA), Retinoic acid (RA), etc, with or without physical modalities such as fractional CO2 laser, and microneedling in managing AN, assessing their clinical outcomes, safety profiles, and long-term effectiveness.

Methods: A systematic search of electronic databases was conducted to identify randomised controlled trials (RCTs), cohort studies, and comparative clinical studies evaluating the efficacy of chemical peels in AN treatment. Studies reporting objective clinical improvements, patient-reported outcomes, and adverse effects were included. The primary outcome measure was improved pigmentation and skin texture, which was assessed using validated scoring systems such as the Acanthosis Nigricans Area and Severity Index (ANASI).

Results: A total of 8 eligible studies were included. TCA (15-20%) peels demonstrated significant improvement in pigmentation compared to glycolic acid (35-70%), though higher concentrations increased the risk of post-inflammatory hyperpigmentation (PIH). Microneedling, particularly when combined with TCA peels, enhanced treatment outcomes by improving agent penetration and collagen remodelling.

Conclusion: Chemical peels offer varying degrees of efficacy in the treatment of AN. TCA peels remain a cost-effective first-line option, while physical modalities such as fractional CO2 laser offer superior long-term benefits for thicker lesions. Microneedling enhances the effects of peels, making combination therapies a promising approach. Future studies should focus on standardising treatment protocols, assessing long-term outcomes, and exploring newer treatment combinations to optimise AN management.

INTRODUCTION

Acanthosis nigricans (AN) is a dermatological disorder characterised by hyperpigmented, thickened, and velvety-textured skin, commonly affecting flexural areas such as the neck, axillae, groin, and inframammary folds. It is often associated with metabolic disorders, particularly insulin resistance, obesity, polycystic ovarian syndrome (PCOS), and type 2 diabetes mellitus (T2DM).[1] While benign acanthosis nigricans is frequently linked to metabolic syndromes, a rare but serious variant, malignant acanthosis nigricans, is associated with underlying malignancies, especially gastric adenocarcinoma.

Acanthosis nigricans is primarily associated with elevated insulin levels that bind to insulin-like growth factor 1 receptors (IGF-1Rs) on keratinocytes and fibroblasts. This binding stimulates the proliferation of these cell types, which manifests as distinct plaques and papillomatosis.[2] Given its strong correlation with metabolic dysfunction, AN is not just a cosmetic concern but a clinical marker of systemic disease, necessitating a multidisciplinary treatment approach. The therapeutic approach includes treating the underlying disease or tumour, avoiding the inciting agent in drug-induced AN, and utilising topical creams, chemical peels, fractional CO2 lasers, and microneedling.[2] Several clinical trials and studies have been done on the effectiveness of chemical peels such as trichloroacetic acid (TCA), glycolic acid (GA), retinoic acid (RA), etc, in treating AN. Hence, it is necessary to conduct a systematic review that analyses the efficacy, safety and role of various chemical peels in managing acanthosis nigricans. We systematically reviewed clinical studies and randomised trials that used either chemical peels as monotherapy or combination therapy with procedures such as fractional CO2 laser, microneedling, etc. and comparison studies with various chemical peels in adult patients with acanthosis nigricans to elucidate their long-term efficacy and safety and provide possible recommendations for their use.

METHODS

Literature search

In October 2025, we performed a comprehensive literature search from inception through January 2026 to study the efficacy of chemical peel treatment on patients with acanthosis nigricans. We used relevant MeSH terms such as ("acanthosis nigricans") AND ("chemical peel" OR "trichloroacetic acid" OR "TCA peel" OR "glycolic acid" OR "retinoic

acid" OR "peeling" OR "chemexfoliation") to search the PubMed/MEDLINE, EMBASE, Cochrane Central Register of Controlled Trials (CENTRAL), and SCOPUS databases. The systematic review was registered in PROSPERO (CRD42024616894) and followed the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines for reporting systematic reviews.

Eligibility criteria and selection of studies

Studies were included following the PICOS principles (Population, Intervention, Comparison, Outcome, and Study design). The inclusion criteria for selecting the articles were English and published from inception to January 2026. Only randomised controlled trials (RCTs), quasi-randomised trials, split-lesion studies, pilot studies, and prospective cohort studies reporting outcomes of chemical peels in patients with AN, either alone or in combination with other interventions for treating acanthosis nigricans in human subjects, were selected for the review. There were no restrictions on country, gender, or age. We excluded preclinical studies, case reports, posters, conference abstracts, editorials, letters and case series. The primary outcome measure was efficacy, and the secondary outcome was safety. Four reviewers selected the articles independently (S.G., D.A., S.R., and N.J.). The final selection was based on a full-text assessment. Reference lists of selected articles were screened for additional relevant studies.

Data extraction

A standardised template for data extraction was built, and four reviewers (S.G., D.A., S.R., and N.J.) independently extracted the baseline and outcome data from all included studies. Discrepancies between the authors were resolved through discussion. Studies published by the same author and in the same year have been checked for possible overlap and data duplication.

Risk of bias assessment

The revised Cochrane Risk of Bias tool for Randomised Controlled Trials (Cochrane Rob 2.0) was utilised by four reviewers (S.G., D.A., S.R., and N.J.) to evaluate the risk of bias in each study.[3] This assessment considered factors such as random sequence generation, allocation concealment, blinding of participants and trial personnel, deviations from anticipated interventions, absence of outcome data, and selection of reported outcomes.

RESULTS

Eligible Studies The systematic data search returned 847 reference articles, of which 147 duplicates were removed. The remaining 694 references were screened based on title and abstract, and 651 were excluded. Full texts of 43 articles were obtained and assessed for eligibility. The inclusion criteria and data completeness were used to select the final 8 articles for this review, as shown in the PRISMA Flow Diagram. **[**Fig. 1**]**

Study Characteristics:

The characteristics of patients in the included studies are shown in Table 1. The review included eight clinical studies and controlled trials published until January 2026, comprising 216 patients. All patients included in this review were aged 10–45 years. Most of the included studies reported a male predominance, and the mean duration of AN ranged from 1 to 20 years. The studies included in this systematic review were conducted in patients with acanthosis nigricans and pseudoacanthosis nigricans, with or without comorbidities such as diabetes, dyslipidemia, etc., at the time of enrollment. Different chemical peels with varying depths of penetration were investigated for their safety and efficacy as monotherapy in Zayed et al.'s study [4], compared with other peels in Bharti et al.'s study [5], and with other skin rejuvenation procedures such as microneedling and lasers in other research.

Table 1
Characteristics of included studies

Name of the Study	Country	Study type	Study population	Age group/ Mean age (years)	Mean duration of disease	Associated systemic diseases	Sites of skin involvement	Treatment protocol
Abu Oun et al.	Egypt	Split neck Comparative study	20 Egyptian patients with neck AN	18–44	2–20 years; Median 5.5	Not detailed, likely excluded	Neck	Right: CO2 laser; Left: 5% Retinoic acid; 4 sessions with 2- week interval
Bharati et al.	India	Randomized open- label study	40 patients with AN	18 (mean)	GA: 2.64 ± 2.06 TCA: 3.64 ± 4.50	Majority were obese or overweight.	Face, neck, elbow	Group A: 15% TCA; Group B: 35% GA; 3 sessions, 2-week intervals
Eldeeb et al.	Egypt	Randomized comparative clinical trial	40 patients with pseudo-AN	20–45	2 ± 0.8 years	Excluded such as diabetes, hormonal disorders, and malignancy	Neck and axilla	Group A: TCA 20% (4 sessions, 4-week interval); Group B: CO2 laser (4 sessions, 4–6week interval)
Fouda et al.	Egypt	Split neck comparative study	20 patients	14–33	Median − 4.5 years, ranging from 2 to 10 years	5% patients have associated systemic diseases.	Neck	Fractional CO2 laser (Right side) Vs TCA 20% peel (Left side)
Ghiasi et al.	Iran	Single-blinded, randomized trial	30 patients (neck or axillary AN)	12–45 yrs Mean: 25.27 ± 10.74	Most < 7 years (70%), others 7– 20 years	17 (56.7%) had obesity, diabetes, PCO and others.	Neck and axilla	One side: Tretinoin 0.05% every other night; other side: GA 70% every 2 weeks; 8 weeks total
Khashaba et al.	Egypt	Randomized clinical trial	40 patients	10–45	1–2 years	Some patients had associated medical conditions.	Neck, axillae, ante cubital fossa	Right side: 15% TCA; Left side: Microneedling + 15% TCA; monthly for 3 months
Zaki et al.	Egypt	Prospective randomized comparative study	20 patients with pseudo-acanthosis nigricans	18–40	Not specified	Excluded systemic diseases such as diabetes, etc.	Neck	Right side: Fractional CO2 laser (3 sessions, 2-week intervals); Left side: Glycolic acid 70% peel (3 sessions, 2-week intervals)
Zayed et al.	Egypt	Pilot study	6 females with 10 lesions of AN.	31.5 years (21–43)	9.4 years	Not mentioned	Neck, cheeks, axilla	TCA 15%, weekly sessions for 4 weeks

Risk of bias assessment among included trials

All studies reported a random allocation of study participants. Four trials adequately reported allocation concealment, all trials performed blinding of participants and researchers, and reported blinding of outcome assessment. [4–11] One study had a low risk of bias concerning selective outcomes reporting, randomisation process and missing outcome data. The methodological quality and risk of bias of the included trials are summarised in Fig. 2a and 2b.

TREATMENT PROTOCOLS:

Various chemical peels were used in the above-finalised studies, administered at distinct intervals and sessions. Few studies used them as monotherapy, and others used them to compare with other peels and procedures to determine their safety and efficacy. The efficacy and safety outcomes of the included studies have been summarised in Table 2.

Table 2
Safety and Efficacy outcomes of the included studies:

Study	Treatment Intervention	Duration of Treatment (weeks)	Baseline assessment	Efficacy Outcomes	Safety and Tolerability
Abu Oun et al. 2021	Fractional CO2 laser vs. Retinoic Acid 5%	8 weeks (4 sessions, biweekly)	ANASI score, dermatologist assessment, dermoscopic evaluation	ANASI Score: Highly significant reduction in the score on both halves after therapy. Dermoscopic Score: Improvement seen in dermoscopic features of AN. like sulci cutis, cristae cutis, pigmentation, milia-like cysts, etc. on both halves.	Mild erythema and peeling with RA, no serious events
Bharati et al. 2024	15% TCA vs. 35% GA	6 weeks (3 sessions, biweekly)	ANASI score, PAS, PSS	ANASI Scores: TCA group: Decrease from 22.33 to 13.26; GA group: Decrease from 17.07 to 12.49. Both improvements were statistically significant ($p < 0.001$). Physician Assessment Score (PAS): Greater proportion of TCA group participants achieved PAS > 2. Patient Satisfaction Score (PSS): Higher satisfaction in the TCA group (45% excellent) than GA group (15% excellent) .	Mild irritation and PIH noted in both groups
Eldeeb et al. 2021	Fractional CO2 laser vs. TCA 20%	16–24 weeks (up to 4 sessions)	Percentage improvement, dermatologic assessment	TCA had a higher frequency of excellent or marked improvement over laser in blinded physician assessment after treatment	Higher adverse effects in TCA group (erythema, PIH, burning)
Fouda et al.	Fractional CO2 Laser (right side) vs TCA 20% (left side)	12 weeks (4 sessions every three weeks)	ANASI score, dermatologist assessment	Fractional CO2 laser side: Excellent improvement – 20%, Marked improvement − 45%, moderate improvement − 35%. TCA 20% peel side: moderate improvement – 50%, mild improvement – 40%, and marked improvement – 2%. ANASI: Greater % of reduction in fractional CO2 laser (from 20 to 6) compared to the TCA 20% peel (from 20 to 8)	Pain and erythema noted in 13 (65%) patients in Fractional CO2 laser treatment as compared to none with TCA peel.
Ghiasi et al. 2024	Tretinoin 0.05% vs. GA 70%	8 weeks	Treatment response, patient satisfaction, photographic evaluation	Tretinoin more effective than glycolic acid ($p = 0.02$ for treatment response, $p = 0.008$ for patient satisfaction) in treating axillary lesions. However, there was no significant difference in efficacy between the tw treatments in neck treatment.	Minimal side effects; some burning and irritation reported

Study	Treatment Intervention	Duration of Treatment (weeks)	Baseline assessment	Efficacy Outcomes	Safety and Tolerability
Khashaba et al. 2024	15% TCA vs. 15% TCA + Microneedling	12 weeks (3 monthly sessions)	Improvement in pigmentation, texture, SCANS score	Excellent improvement in pigmentation and texture was more common with the TCA + microneedling arm. Statistically significant (P-values < 0.001) improvement seen in both arms.	No serious side effects reported
Zaki et al. 2018	Fractional CO2 laser vs. GA 70%	6 weeks (3 sessions, biweekly)	ANASI score, dermatologist assessment, photographs	ANASI Score: GA side: Decrease from 23.55 to 13.50 ($p = 0.001$). In CO_2 laser group, minimal improvement seen (23.50 to 19.10), not statistically significant ($p = 0.1$) Physician assessment: Significantly greater improvement with GA peel > CO_2 laser on a 0–4 scale.	Mild transient erythema and burning with GA, no major side effects
Zayed et al. 2014	TCA 15%	4 weeks (weekly sessions)	Investigator and patient assessment, clinical response	All six patients showed improvement in hyperpigmentation and skin texture. Investigator-graded responses: excellent in 3 lesions, moderate in 5, mild in 2.	No side effects reported.

EFFICACY OF CHEMICAL PEELS AS MONOTHERAPY:

Trichloroacetic Acid (TCA) 15–20% Peels

15% TCA peel consistently showed moderate to good improvement across multiple studies. In Bharati et al., 15% TCA was more effective than 35% GA, with a greater ANASI score reduction (baseline: 22.33 → 13.26 at 8 weeks, $P < 0.001$) across three sessions. In Khashaba et al., TCA plus microneedling showed significantly greater improvement in both pigmentation and texture than TCA alone [6]. In a small Egyptian pilot cohort conducted by Zayed et al., six women with about 10 AN lesions in total (neck, face, axilla) underwent weekly 15% TCA for 4 weeks; all lesions improved in pigmentation, thickness, and overall appearance, with no side effects.[4] Fouda et al. (2023) reported moderate improvement with 20% TCA in 50% of patients, but inferior to fractional CO_2 laser (20% marked improvement).[7] Eldeeb et al. (2021) noted a marked improvement in only 10% of patients after four weekly sessions with 20% TCA.[8]

Safety & Tolerability:

Mild and transient burning and erythema were the most common side effects; PIH was more prevalent with TCA, especially in darker skin types. As reported by Bharati et al., typical side effects with 15% TCA included peeling (70%), burning (45%), and transient PIH.(5) Higher PIH rates (20%) and persistent erythema were seen with 20% TCA in the study by Eldeeb et al., 2021.[8] Combination with microneedling increased discomfort (pain, erythema, etc.), but did not significantly increase complication rates.

Glycolic Acid (GA) 35–70% Peels

Efficacy:

GA peel at 70% concentration demonstrated moderate clinical improvement (43%) in pseudo-AN and was more effective than fractional CO_2 in Zaki et al.'s study.[9] However, Bharati et al. (2024) found a modest ANASI reduction with GA 35% (17.07 → 12.49 at 8 weeks, $P < 0.001$), with only 5% of patients achieving more than 50% improvement.[5] However, Ghiasi et al. (2024) noted GA's inferiority to tretinoin for axillary AN ($P = 0.02$).[10] Taken together, GA peels appear capable of achieving moderate reductions in pigmentation and thickness, with GA 70% sometimes outperforming fractionated laser for neck pseudo-AN but not consistently surpassing retinoids or TCA in other settings.

Safety & Tolerability:

GA peels were generally better tolerated with fewer and milder adverse effects than TCA, making them favourable for sensitive skin and as a first-line agent. [4, 5]

COMPARATIVE EFFICACY VERSUS OTHER PEELS AND NON-PEEL THERAPIES:

Retinoic Acid Peel and Topical Retinoids

Efficacy:

Retinoic acid 5% was less effective than the fractional CO_2 laser in Abu Oun et al.'s trial, though it showed significant improvement.[11] Tretinoin 0.05% was more effective than GA 70% for axillary lesions, but peels offered faster results than topical agents in Ghiasi et al.'s study.[10]

Safety & Tolerability:

Tretinoin was generally well-tolerated and suitable for long-term use. Side effects were minimal and localised (dryness, irritation).

Chemical Peels vs Fractional CO_2 Laser

Efficacy

Superior outcomes were observed with the fractional CO_2 laser in comparison to 20% TCA in studies by Fouda et al., with significantly larger reductions in ANASI scores, and Eldeeb et al., with 85% of patients in the laser group achieving a marked to excellent response, versus only 10% in the TCA group.[7, 8]

In contrast, 70% GA peel showed slightly better immediate efficacy than fractional CO_2 in Zaki et al.'s split-neck study (43% vs 19% improvement), possibly due to rapid exfoliation effects.[9] Compared with retinoic acid, fractional CO_2 again showed superior efficacy in clinical and dermoscopic assessments. Thus, fractional CO_2 appears substantially more efficacious than TCA 20%, but its advantage over GA 70% is inconsistent and may be negligible for pure AN of the neck.

Safety & Tolerability:

The fractional CO_2 laser had fewer side effects like PIH (5% vs 20% in the TCA group), as seen in a study by Eldeeb et al. [8] However, cases of PIH and folliculitis were reported with CO_2 treatment in Zaki et al.'s study, highlighting possible variation based on skin type or the treatment site.[9] Pain and erythema were more frequent than with peels, as shown by the Fouda et al. study.[7]

TCA alone vs TCA plus microneedling

Khashaba et al. randomised 40 patients with AN to split-lesion treatment with TCA 15% peel alone versus microneedling followed by a single coat of TCA 15% every 2 weeks for four sessions. Both sides demonstrated significant improvement in overall AN grade (SCANS) after treatment, but the combination side showed greater gains in pigmentation and texture, and higher patient satisfaction, despite increased procedural pain. [6] This trial suggests that combining low-strength TCA with microneedling-enhanced delivery enhances efficacy over peel alone without introducing serious safety concerns, and may be an additional option where facilities and patient tolerance permit.

Discussion

Current treatment paradigms for acanthosis nigricans (AN) are evolving to encompass the management of cutaneous pathology, the underlying condition, and pharmacological agents. Non-pharmacological approaches include weight management and increased physical activity, aimed at improving insulin sensitivity in individuals with insulin-resistant AN. The treatment approach for AN is multifaceted, as dermatological manifestations frequently coexist with underlying medical conditions. Preliminary investigations for the workup of AN should involve evaluating patients for insulin resistance syndrome, characterised by obesity, dyslipidemia, hypertension, and type II diabetes mellitus.[12] Health care providers should procure a fasting lipid panel, glucose, and insulin levels, and complete blood count and liver function

tests. In instances where malignancy-associated AN is suspected, imaging modalities such as plain radiography, computed tomography, or magnetic resonance imaging may yield pertinent insights. Using oral metformin and other insulin-sensitising medications is beneficial, as these therapeutic strategies target the underlying etiological factors contributing to AN.[2] Topical retinoids are regarded as the primary treatment for insulin-resistant acanthosis nigricans (AN) because they modify the keratinisation rate. However, topical tretinoin requires prolonged periods of application and predominantly targets hyperkeratosis, without markedly enhancing hyperpigmentation. Other topical agents, including vitamin D3 analogues such as calcipotriol, salicylic acid, urea, and podophyllin, require frequent applications.

The modified triple combination regime (tretinoin 0.05%, hydroquinone 4%, fluocinolone acetonide 0.01%) has reportedly helped improve the lesions when used at night.[13] Chemical peels have emerged as the primary treatment for various pigmented dermatoses, including acanthosis nigricans affecting the face, neck, and axillae.

From the synthesised data, it has been found that the chemical peels consistently yield clinically meaningful but rarely complete improvement in AN, with typical responses falling in the mild-to-moderate (1–50% clearance) range after 3–4 sessions, and excellent responses (≥ 76% clearance) seen in a minority of patients, across controlled and uncontrolled trials. TCA 15% and GA 35–70% both substantially reduce AN severity score (ANASI or equivalent) over 6–8 weeks compared with baseline, but neither can currently be considered a definitive stand-alone cure. [4–11]

Topical tretinoin remains at least as effective, and often more so, than peels in axillary and possibly truncal AN, but requires longer continuous use and is more irritating; peels may therefore be best positioned as adjunctive or “boosting” procedures for cosmetic debulking of pigmentation and hyperkeratosis in selected patients already undergoing systemic and topical measures for the underlying metabolic milieu. [6–10]

Considering the site of treatment and the treatment modality that were used, neck pseudo-AN appears particularly amenable to GA 70% peels and fractional CO□, with GA sometimes outperforming laser in short-term pigmentation reduction and fractional CO□ clearly surpassing TCA 20% in both neck and axillae. Axillary lesions, by contrast, responded better to topical tretinoin than to 70% GA in Ghiasi et al., suggesting that site-specific occlusion dynamics, skin thickness, and sweat may modulate peel efficacy. [4, 6, 8, 11]

Combination approaches such as microneedling plus 15% TCA provide enhanced textural and pigment improvement over peel alone and may point the way toward lower-strength peels delivered via energy- or device-assisted methods to maximise efficacy while minimising depth-related complications.[6]

TCA 15–20% (superficial) is a safe, inexpensive option that produces mild to moderate improvement in most patients with AN after 3–4 sessions; however, this approach carries a higher risk of post-inflammatory hypopigmentation (PIH) compared with other interventions. It may be preferable to GA 35% for general AN severity reduction, but it is less effective than fractional CO□ and often slightly inferior to topical tretinoin in head-to-head trials.[4, 5, 8] GA 70% is particularly effective for neck pseudo-AN, sometimes outperforming fractional CO□ and offering faster pigment shedding due to accelerated exfoliation, though its advantage diminishes in axillae, and it is not clearly superior to topical retinoids. [9, 10] Fractional CO□ laser is superior to TCA 20% for pseudo-AN and at least comparable to GA 70%, but peels remain attractive where lasers are unavailable or unaffordable.[7–9] Topical tretinoin (0.025–0.05%) often matches or exceeds peel efficacy, especially in axillary lesions, but at the cost of more irritation and a need for prolonged application; peels are best viewed as adjuncts or accelerators of cosmetic improvement in motivated patients.[8, 10] Adjunctive microneedling enhances TCA 15% outcomes, improving pigmentation and texture at the expense of greater procedural pain but without added serious AEs, and may be a highly effective and practical alternative, especially in resource-limited environments. [7]

Among the modalities evaluated, fractional CO□ laser demonstrated superior efficacy and optimal cosmetic outcomes, albeit with moderate tolerability. However, it is imperative to consider the associated costs of these treatments and the potential risk of post-inflammatory hyperpigmentation.

Limitations and Future Directions:

Nevertheless, chemical peels have emerged as the primary treatment alongside other topical agents for all pigmentary disorders, including acanthosis nigricans. Both chemical peels and fractional CO□ lasers are effective for acanthosis nigricans, but each offers trade-offs between efficacy and tolerability. Enhancing patients' comprehension of AN and its

aetiology should be a cornerstone of effective clinical management. While aesthetic outcomes are indeed significant in the context of AN, it is imperative to identify and address the underlying pathophysiology to ensure comprehensive care.

The evidence base is limited by small sample sizes (often n = 20–40), short follow-up periods (usually ≤ 3 months), single-centre study designs, and a heterogeneous scoring system, which together limit generalisability and preclude robust pooled estimates. Many comparisons are open-label or split-site without controls, raising the possibility of expectation and assessor bias; however, the use of blinded dermatologists and standardised indices (ANASI, SCANS) in several trials partially mitigates this. [4–10]

Notably, most trials focus on obesity-associated pseudo-AN in young adults of darker phototypes; extrapolation to syndromic, malignant or drug-induced AN, to lighter skin types, or to pediatric populations should be cautious. Furthermore, nearly all studies continued or recommended lifestyle modification and weight reduction, so the pure incremental benefit of peels over optimised systemic management remains incompletely defined. [5–8]

Declarations

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performed by any of the authors.

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Data Availability: All data generated or analysed during this study are included in this article. Further enquiries can be directed to the corresponding author.

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Figures

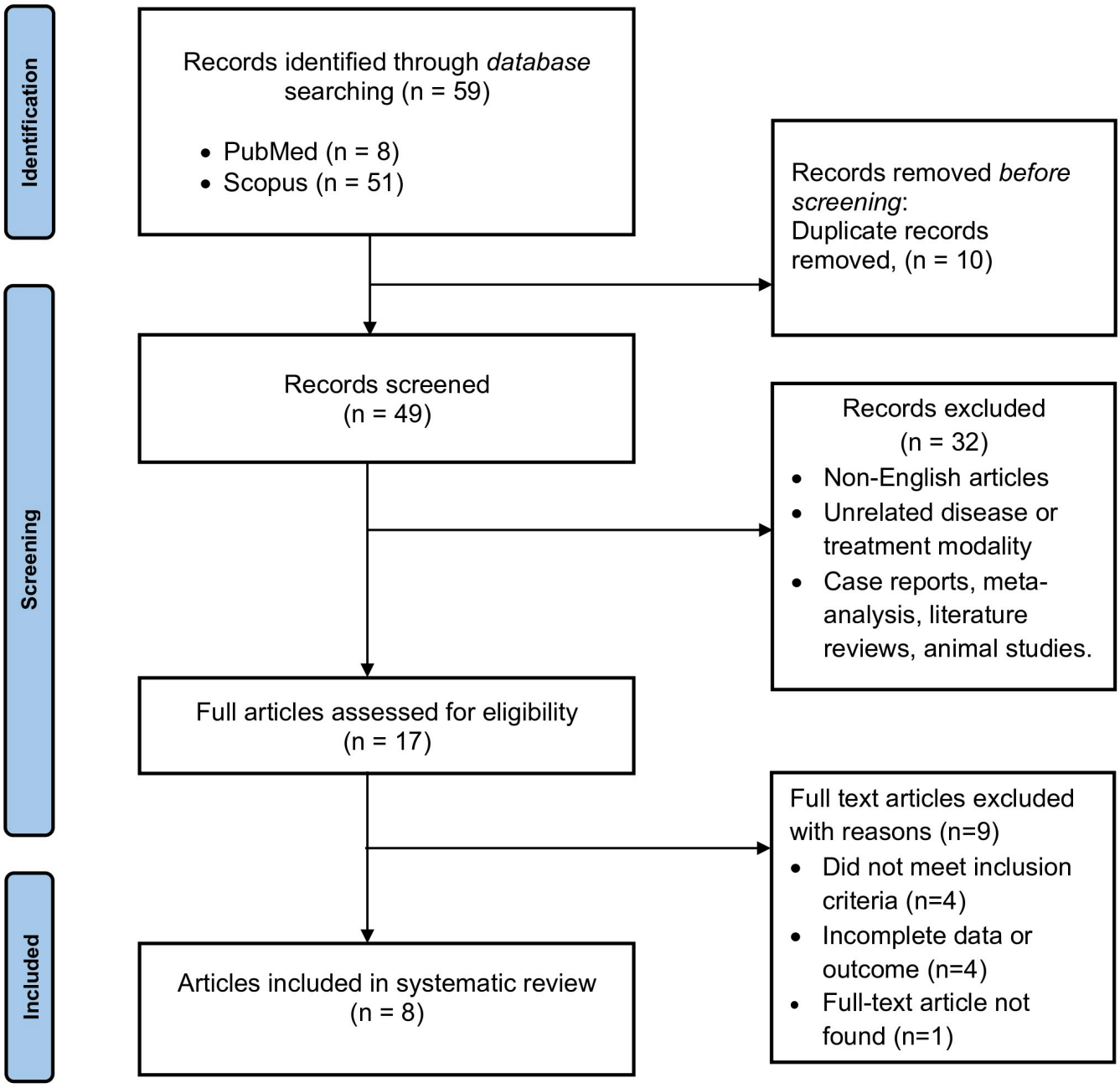


Figure 1

Fig. 2a

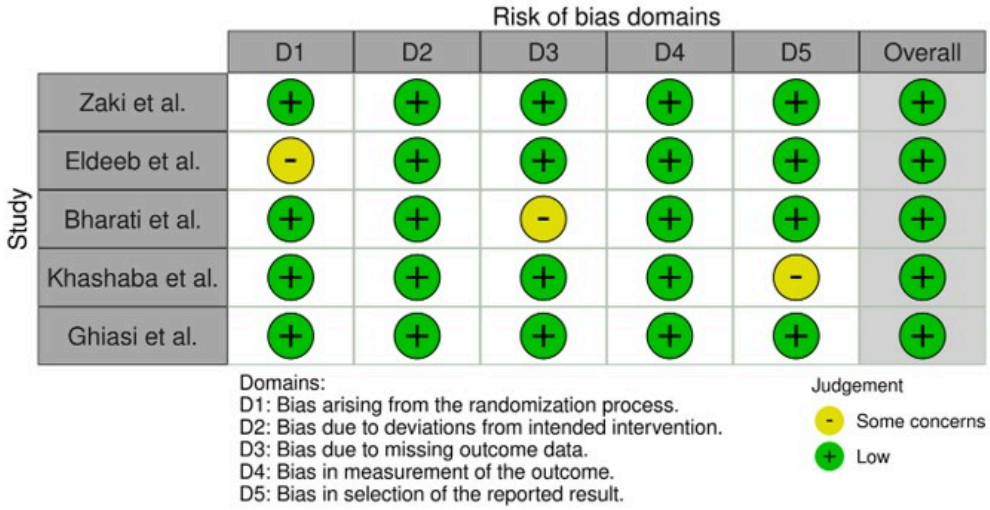


Fig. 2b

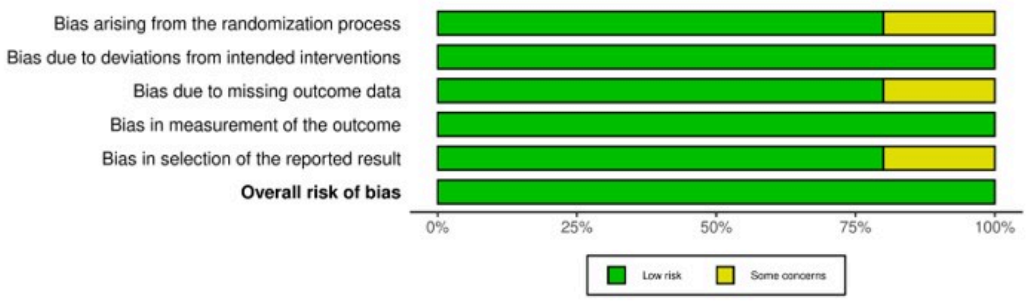


Figure 2

a. The methodological quality of the included randomised trials was categorised as ‘high’, ‘low’, ‘some concerns’, or ‘no information’ risk of bias according to the Cochrane risk-of-bias assessment tool.

Fig. 2b. Graph summarising the risk of bias of all included randomised trials.