Visual Arts-Based Interventions in Surgical Education: A Systematic Review

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Background

Surgeons utilize visual arts for various purposes, including sketching operative plans, documenting findings, and personal well-being; this has been reported anecdotally and through formal studies.[1,2]

Gaps remain in integrating art training into medical education and determining effective frameworks for process design and outcome measurement.[1,3]

Assessing the evidence is necessary to understand how visual art benefits surgical trainees' skill development across the continuum of training.

Objectives

To evaluate the impact of **visual arts-based interventions** in surgical education as assessed by evaluation of **technical knowledge and skills** in **surgical learners** of all levels

Methods

Databases	Embase, MEDLINE, Web of Science, Preprint Citation Index, grey literature
Screening	Completed independently by 2 individual reviewers
Study Quality	Medical Education Research Study Quality Instrument (MERSQI), scored /18

Inclusion Criteria

- English language
- Visual-arts based intervention
- Technical skill/knowledge outcome
- Population: any level of medical learner

Exclusion Criteria

- Non-English language
- No visual-arts based intervention
- Population: Non-medical learner
- Reviews, editorials, letters, case reports

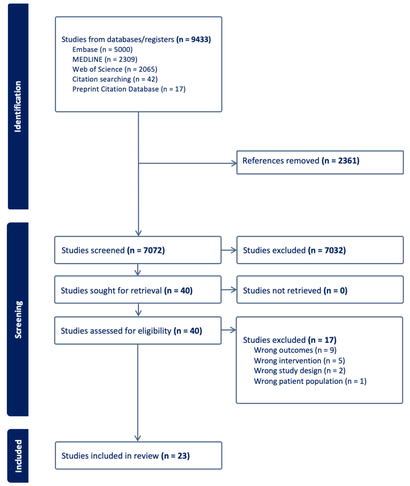


Figure 1: PRISMA flow diagram depicting systematic review search strategy.

Results

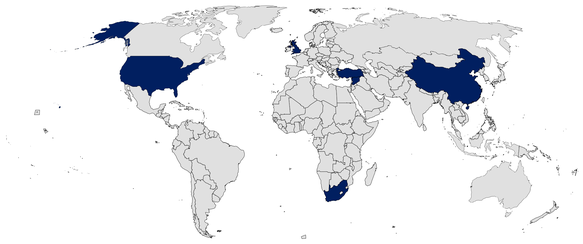


Figure 2: Included studies by country: United Kingdom (3), Syria (1), United States (14), Turkey (1), China (1), South Africa (3).

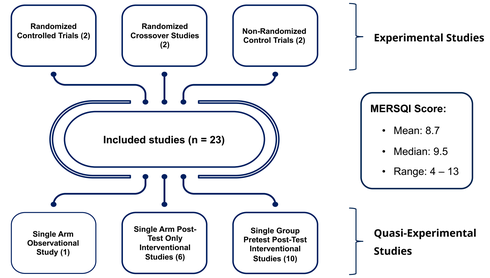
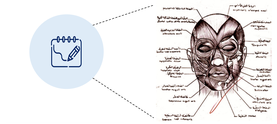
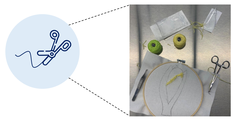


Figure 3: Included study designs and descriptions.



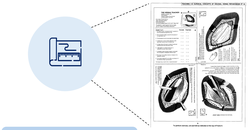
Anatomy Drawing (n = 9)

Figure 4: Example of work produced from anatomy drawing intervention from Alsaid et al. (2016).[4]



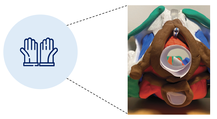
Cross-Suturing (n = 1)

Figure 5: Example of work produced from cross-suturing intervention from Cemaj et al. (2023).[5]



Paper Manipulation (n = 1)

Figure 6: Template for activity from paper manipulation intervention from Mann et al. (1997).[6]



Clay Modeling (n = 13)

Figure 7: Example of work produced from anatomy drawing intervention from Chong et al. (2022).[7]

	Study Type	Study Population	Visual Arts Intervention(s)	Outcome(s) Assessed	Method(s) of Outcome Assessment	MERSQI Score
Included Studies (Full Texts & Abstracts)	• RCTs (2) • Randomized crossover study (2) • Single-Group Pretest Post-test Interventional Study (10) • Single arm post-test only interventional study (6) • Non-randomized control trial (2) • Single arm observational study (1)	• Medical students (14) • Residents & physicians (10)	• Anatomy drawing (9) • Clay modeling (13) • Cross suturing (1) • Paper manipulation (1)	• Anatomy knowledge via formal testing (14) • Accuracy of anatomical drawings (1) • Suturing ability and time (1) • Comfort and satisfaction with intervention (7) • Understanding of surgical procedures, potential complications, and associated anatomy (4) • Confidence in anatomical knowledge (1)	• Multiple choice, fill-in-the-blank, and/or true-false anatomy test (13) • Qualitative experience survey (6) • Drawing submission and grading of accuracy (2) • Likert scale questionnaire regarding experience (1) • American College of Surgeon's performance and rating tool (1) • Focus group discussion (1) • Self-reported confidence survey (1) • Qualitative individual interviews (4)	• Range: 4 – 13 • Median: 9.5 • Mean: 8.7

Table 1: Summary of study characteristics for included full-texts and abstracts.

Implications

Based on evidence, the integration of visual art in surgical education and its impact on trainees' technical skills and knowledge remains poorly understood.

Filling this gap is crucial for evaluating existing visual arts interventions, their effectiveness, and their benefits for surgical learners and patients alike.

Limitations

Heterogeneity of visual arts interventions limits effective assessment of individual effects.

Outcome/assessment method variability restricts conclusions about intervention efficacy.

Limited high-quality RCTs hinders ability to draw robust conclusions and recommendations.

Future Directions

The growing number of recent studies reflects increasing interest in arts-based surgical education.

Future research should explore diverse visual arts interventions and their effects on skill and knowledge acquisition.

High-quality RCTs are needed to compare these interventions with traditional teaching methods and assess their long-term impacts.

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References

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