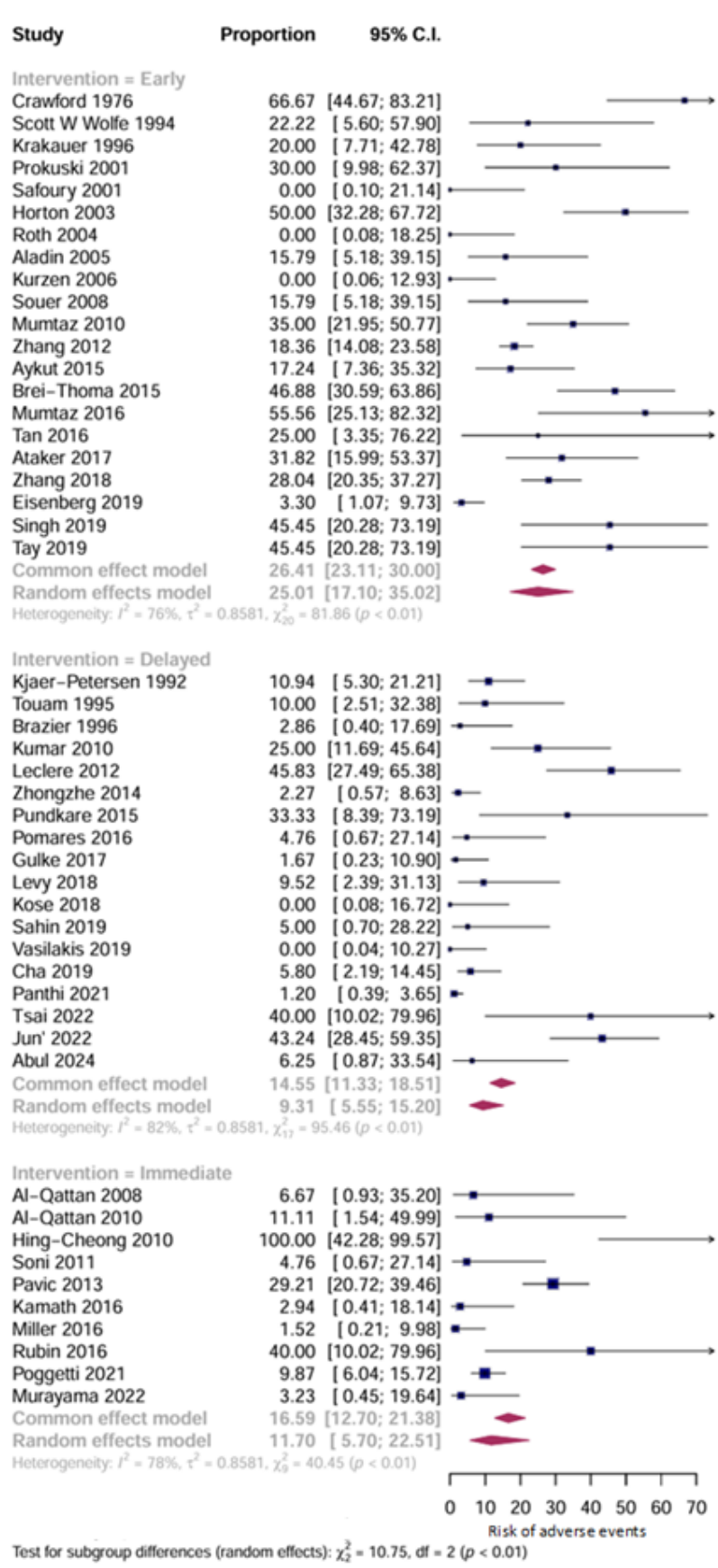
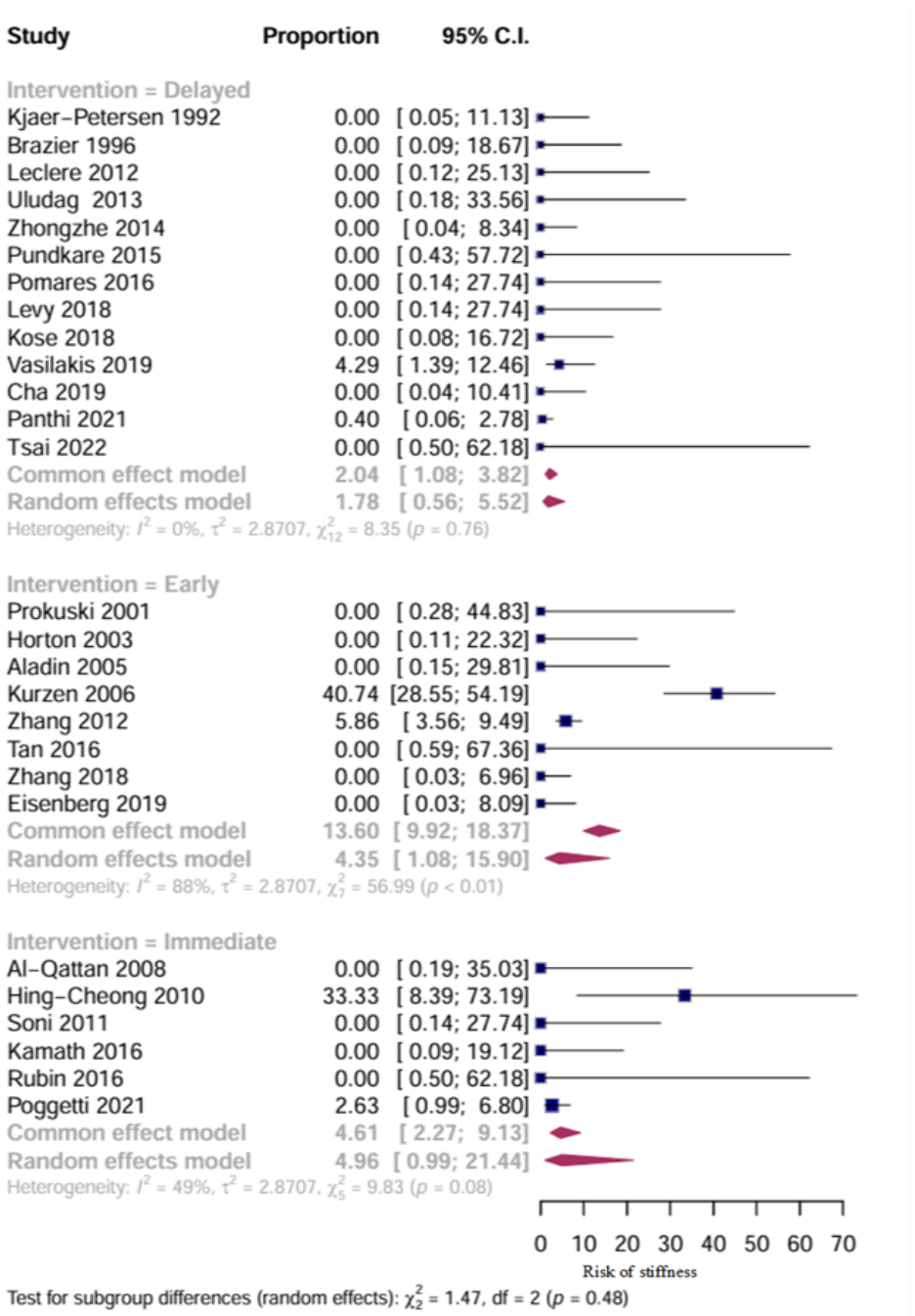
Supplementary Material- Contents

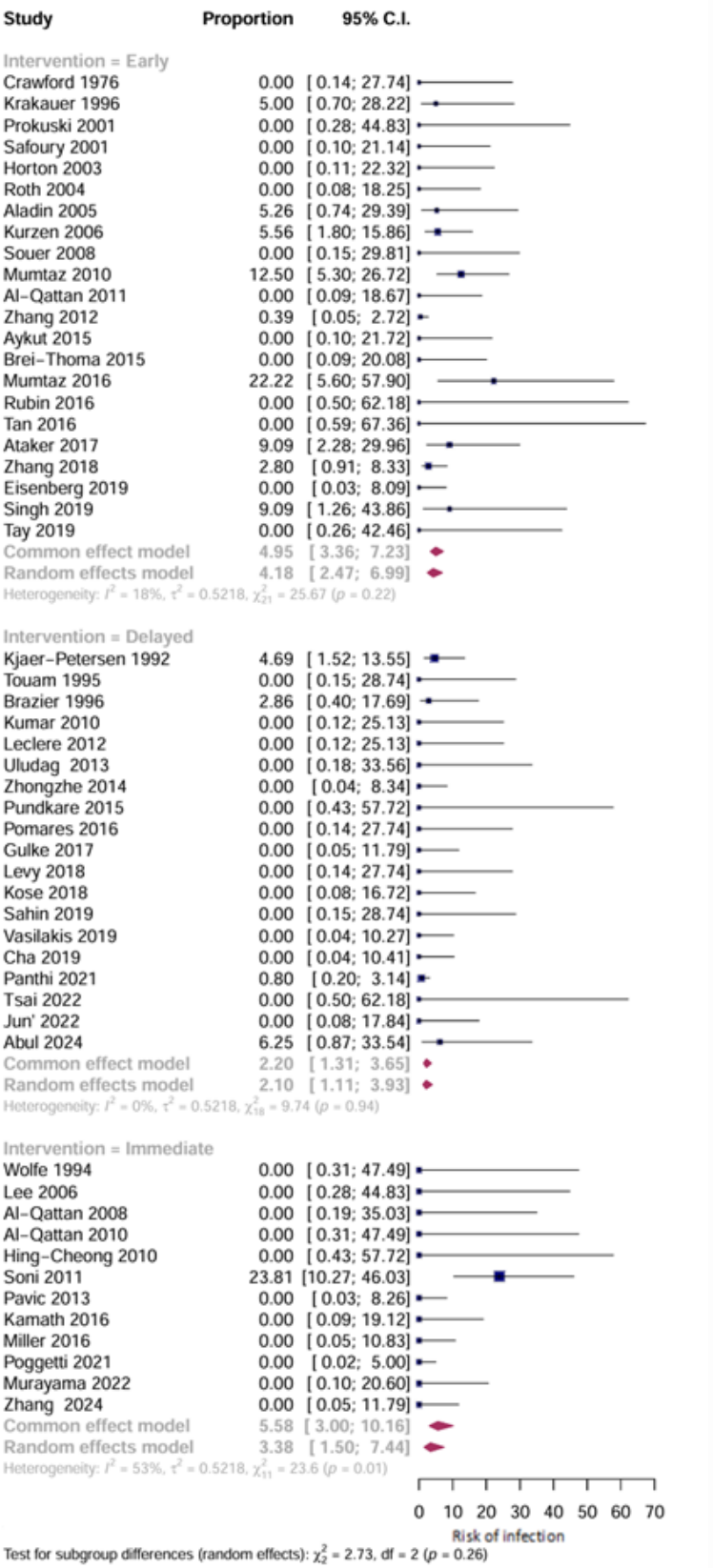
Supplementary Figure 1. Meta-analysis - total adverse events



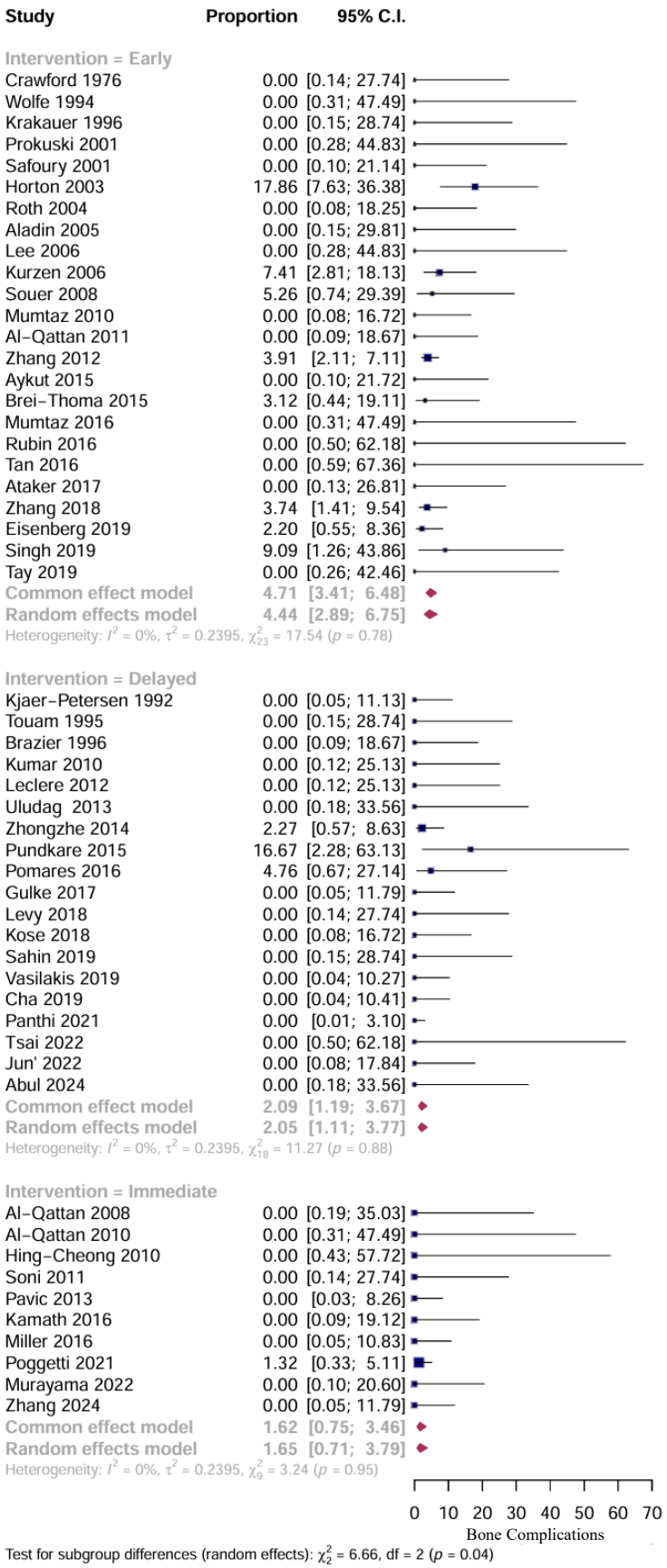
Supplementary Figure 2. Meta-analysis- stiffness



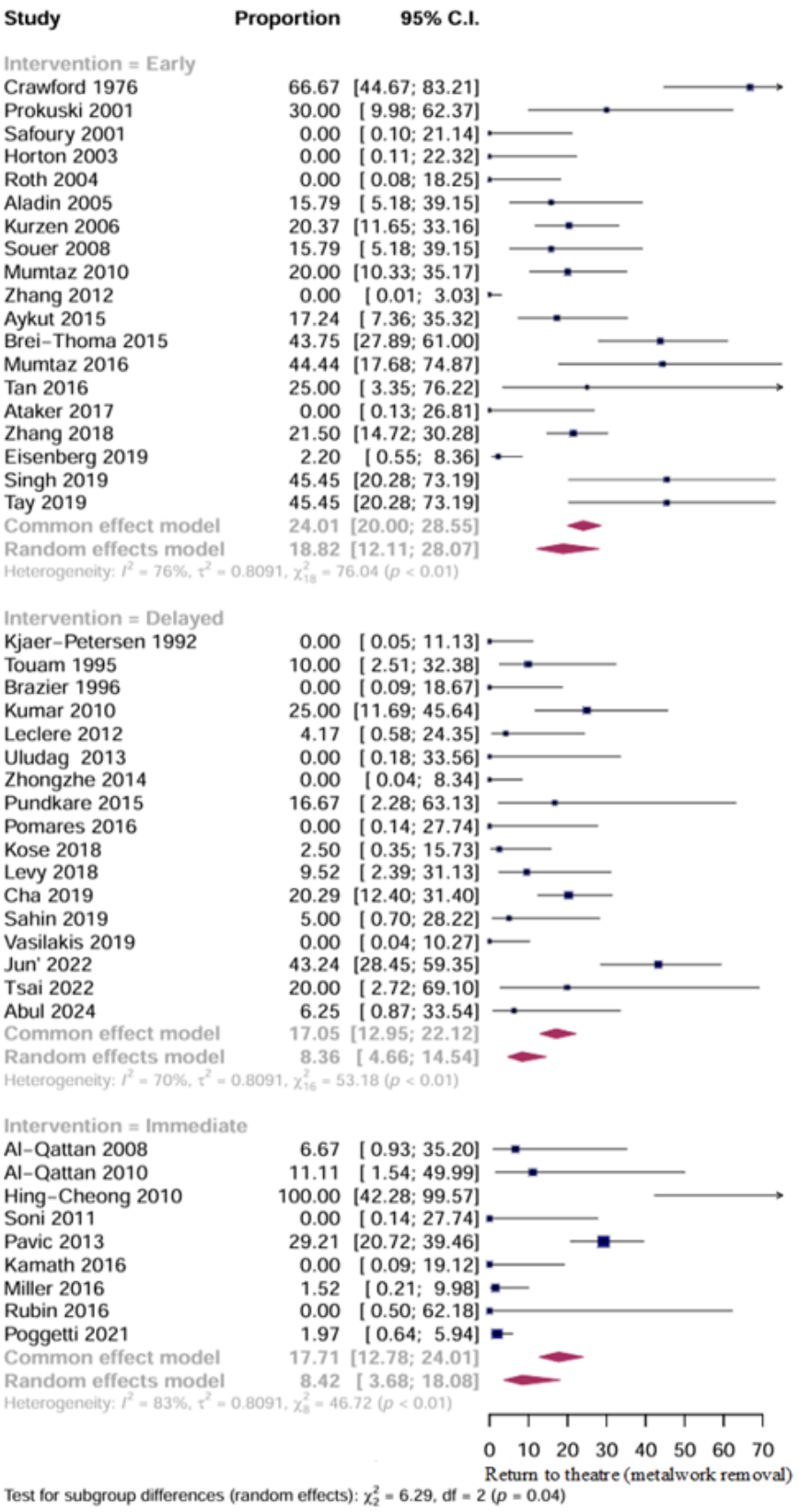
Supplementary Figure 3. Meta-analysis- Surgical site infection



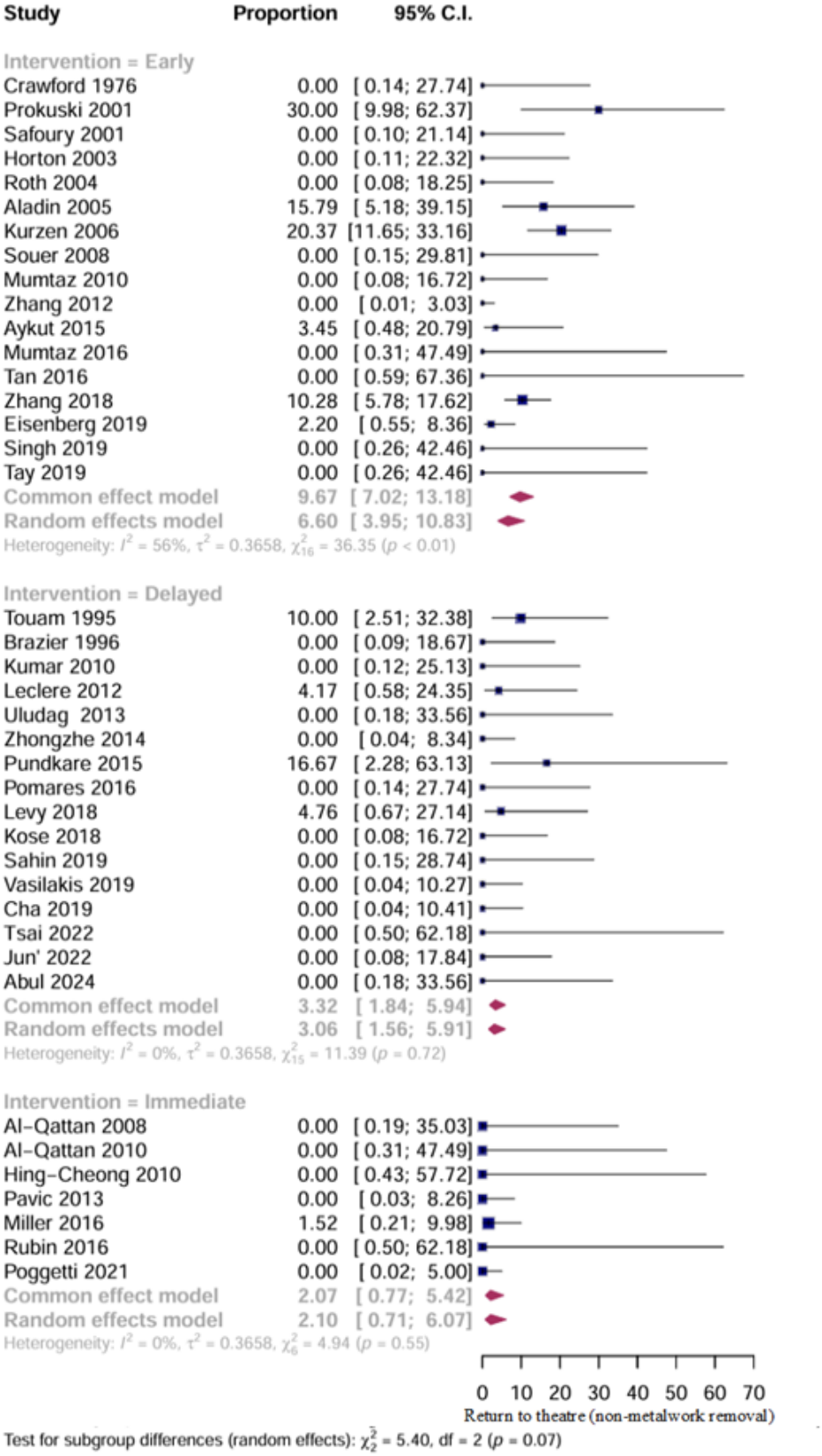
Supplementary Figure 4. Meta-analysis – bone complications



Supplementary Figure 5. Meta-analysis – return to theatre



Supplementary Figure 6. Meta-analysis – return to theatre non-metalwork



Supplementary Figure 7. Search strategies

Date run: 12th January 2024

Medline (Ovid MEDLINE® Epub Ahead of Print, In-Process & Other Non-Indexed Citations, Ovid MEDLINE® Daily and Ovid MEDLINE®) 1946 to present

1 hand injuries/ or finger injuries/ 19496

2 exp Hand/ 88720

3 exp Hand Bones/ 13653

4 hand joints/ or carpal joints/ or carpometacarpal joints/ or finger joint/ or exp metacarpophalangeal joint/ 11728

5 (hand? or finger? or thumb?).ti,ab,kf. 604537

6 (metacarp* or meta-carp* or carpal* or phalan*).ti,ab,kf. 43132

7 (capitate or hamate or lunate or pisiform or scaphoid or trapezium or trapezoid or triquetrum).ti,ab,kf. 11950

8 (intercarp* or inter-carp* or carpometacarp* or interphalange* or inter-phalan* or metacarpophalan* or meta-carpophalan*).ti,ab,kf. 14165

9 1 or 2 or 3 or 4 or 5 or 6 or 7 or 8 667995

10 exp fractures, bone/ 212003

11 Fracture Healing/ 15107

12 (fracture* or broken or break*).ti,ab,kf. 640810

13 10 or 11 or 12 683695

14 fracture fixation, internal/ or fracture fixation, intramedullary/ or exp internal fixators/ 89387

15 (internal fixation or internal fracture fixation or internal surgical fixation or osteosynthesis).ti,ab,kf. 35450

16 (plate? or screw? or rod? or pin?).ti,ab,kf. 359744

17 14 or 15 or 16 413554

18 open fracture reduction/ 1309

19 (open reduction or open fracture reduction or open surgical reduction).ti,ab,kf. 15474

20 18 or 19 15669

21 17 and 20 12944

22 ORIF.ti,ab,kf. 3016

23 21 or 22 13481

24 (rehab* or physiotherap* or physical therap* or hand therap* or postoperative care or post-operative care).ti,ab,kf. 293452

25 exp Rehabilitation/ 358431

26 exp Physical Therapy Modalities/ 181484

27 Postoperative Care/ 60842

28 Immobilization/ 13680

29 (immobili* or mobili*).ti,ab,kf. 419626

30 exp exercise/ 252169

31 exercis*.ti,ab,kf. 374973

32 (move? or moving or movement? or manipulat*).ti,ab,kf.808926

33 (cast? or casting or splint? or splinting or orthotic* or orthes?s or buddy tap* or brace? or bracing or support?).ti,ab,kf. 1585037

34 exp External Fixators/ 23814

35 Orthotic Devices/ or braces/ 12674

36 24 or 25 or 26 or 27 or 28 or 29 or 30 or 31 or 32 or 33 or 34 or 35 3559811

37 9 and 13 and 23 and 36 675

38 limit 37 to (case reports or comment or editorial or letter or "review" or "systematic review") 214

39 37 not 38 461

Embase 1974 to present

1 exp hand fracture/ 3750

2 ((hand? or finger? or thumb? or metacarp* or meta-carp* or carpal* or phalan* or capitate or hamate or lunate or pisiform or scaphoid or trapezium or trapezoid or triquetrum or intercarp* or inter-carp* or carpometacarp* or interphalange* or inter-phalan* or metacarpophalan* or meta-carpophalan*) adj5 (fracture* or broken or break*)).tw,kw. 9807

3 1 or 2 11477

4 osteosynthesis/ 49418

5 intramedullary nailing/ or plate fixation/ 24394

6 internal fixator/ 3776

7 bone implant/ or exp bioabsorbable bone implant/ or exp bone nail/ or exp bone pin/ or exp bone plate/ or exp bone prosthesis/ or exp bone screw/ 88246

8 (internal fixation or internal fracture fixation or internal surgical fixation or osteosynthesis).tw,kw. 40295

9 (plate? or screw? or rod? or pin?).tw,kw.427192

10 or/4-9 505326

11 open fracture reduction/ 2575

12 (open reduction or open fracture reduction or open surgical reduction).tw,kw. 16715

13 11 or 12 17894

14 10 and 13 14700

15 ORIF.tw,kw. 3663

16 14 or 15 15572

17 (rehab* or physiotherap* or physical therap* or hand therap* or postoperative care or post-operative care).tw,kw. 411142

18 exp rehabilitation/ 497881

19 exp physiotherapy/ 110921

20 postoperative care/ 108876

21 immobilization/ or physical restraint/ 53047

22 mobilization/ 40249

23 (immobili* or mobili*).tw,kw. 504155

24 exp exercise/ 442591

25 exercis*.tw,kw. 501055

26 (move? or moving or movement? or manipulat*).tw,kw. 970588

27 (cast? or casting or splint? or splinting or orthotic* or orthes?s or buddy tap* or brace? or bracing or support?).tw,kw. 2025934

28 exp external fixator/ 8426

29 splint/ or exp external splint/ or finger splint/ or moldable splint/ or exp wrist splint/ or plaster cast/ or brace/ or wrist brace/ 26224

30 or/17-29 4565706

31 3 and 16 and 30 417

32 limit 31 to (editorial or letter or note or "review") 57

33 31 not 32 360

Cochrane Central Database of Controlled Trials (CENTRAL)

#1 [mh ^"hand injuries"] or [mh ^"finger injuries"] 343

#2 [mh hand] 2914

#3 [mh "Hand Bones"] 239

#4 [mh ^"hand joints"] or [mh ^"carpal joints"] or [mh ^"carpometacarpal joints"] or [mh ^"finger joint"] or [mh "metacarpophalangeal joint"] 407

#5 (hand? or finger? or thumb?):ti,ab,kw 51997

#6 (metacarp* or meta-carp* or carpal* or phalan*):ti,ab,kw 3439

#7 (capitate or hamate or lunate or pisiform or scaphoid or trapezium or trapezoid or triquetrum):ti,ab,kw 509

#8 (intercarp* or inter-carp* or carpometacarp* or interphalange* or inter-phalan* or metacarpophalan* or meta-carpophalan*):ti,ab,kw 1094

#9 #1 or #2 or #3 or #4 or #5 or #6 or #7 or #8 54022

#10 [mh "fractures, bone"] 8474

#11 [mh ^"Fracture Healing"] 761

#12 (fracture* or broken or break*):ti,ab,kw 53226

#13 #10 or #11 or #12 53279

#14 [mh ^"fracture fixation, internal"] or [mh ^"fracture fixation, intramedullary"] or [mh "internal fixators"] 3086

#15 ("internal fixation" or "internal fracture fixation" or "internal surgical fixatin" or osteosynthesis):ti,ab,kw 2920

#16 (plate? or screw? or rod? or pin?):ti,ab,kw 15372

#17 #14 or #15 or #16 17524

#18 [mh ^"open fracture reduction"] 74

#19 ("open reduction" or "open fracture reduction" or "open surgical reduction"):ti,ab,kw 1311

#20 #18 or #19 1311

#21 #17 and #20 1178

#22 ORIF:ti,ab,kw 376

#23 #21 or #22 1258

#24 (rehab* or physiotherap* or (physical NEXT therap*) or (hand NEXT therap*) or "postoperative care" or "post-operative care"):ti,ab,kw 96786

#25 [mh rehabilitation] 51799

#26 [mh "Physical Therapy Modalities"] 36360

#27 [mh ^"Postoperative Care"] 5480

#28 [mh ^Immobilization] 631

#29 (immobili* or mobili*):ti,ab,kw 31261

#30 [mh exercise] 38890

#31 exercis*:ti,ab,kw 139891

#32 (move? or moving or movement? or manipulat*):ti,ab,kw 66242

#33 (cast? or casting or splint? or splinting or orthotic* or orthes?s or buddy tap* or brace? or bracing or support?):ti,ab,kw 137664

#34 [mh "External Fixators"] 1196

#35 [mh ^"Orthotic Devices"] or [mh ^braces] 1159

#36 #24 or #25 or #26 or #27 or #28 or #29 or #30 or #31 or #32 or #33 or #34 or #35393077

#37 #9 and #13 and #23 and #36 128

Limited to Trials 126

WHO ICTRP

Title: (hand OR hands OR finger OR fingers OR thumb OR thumbs OR phalanges OR carpals or metacarpals OR phalangeal OR phalange OR carpal OR metacarpal OR capitate OR hamate OR lunate OR pisiform OR scaphoid OR trapezium OR trapezoid OR triquetrum OR intercarpal OR inter-carpal OR carpometacarpal OR interphalangeal OR metacarpophalangeal) AND (ORIF OR "open reduction" OR "internal fixation" OR "open fracture reduction" OR "open surgical reduction" OR "internal fracture fixation" OR "internal surgical fixation")

Status: All

Run: 12/01/2024

Results: 12

ClinicalTrials.gov

Condition/disease (hand OR hands OR finger OR fingers OR thumb OR thumbs OR phalanges OR carpals or metacarpals OR phalangeal OR phalange OR carpal OR metacarpal OR capitate OR hamate OR lunate OR pisiform OR scaphoid OR trapezium OR trapezoid OR triquetrum OR intercarpal OR inter-carpal OR carpometacarpal OR interphalangeal OR metacarpophalangeal)

Intervention/treatment ORIF OR "open reduction" OR "open surgical reduction" OR "internal fixation" OR "open fracture reduction" OR "internal fracture fixation" OR "internal surgical fixation"

Run: 12/01/2024

Results: 62

Supplementary Figure 8. Checklist for study inclusion.

Inclusion criteria:

1) Hand fracture (meta-carpal/ phalanges/ fracture-dislocations/ carpo-metacarpal fracture combinations) AND
2) Treated with ORIF within 2 weeks of injury AND
3) Post-operative rehabilitation or immobilization care reported AND
4) Outcome measures (PROMs *OR* clinically relevant outcome data *OR* adverse events) AND
5) Study type (experimental studies (RCT) *OR* observational studies (cohort/ case-control/ case series)
    a. Conference abstracts were included where sufficient data was present for extraction.
    b. No limitation on study size was imposed.

Exclusion criteria:

1) Ineligible fracture types (carpal fractures *OR* distal radius fractures *OR* mallet fractures *OR* avulsion fractures *OR* combined hand & distal radius fractures) OR
2) Not ORIF (closed reduction/ external fixation/ unstable fixation) OR
3) Delayed ORIF (>2 weeks from injury) OR
4) Non-human studies OR
5) No reporting on rehabilitation OR
6) Ineligible outcome reported OR

Ineligible study type (case reports, letters, opinion pieces, literature reviews)

Supplementary Figure 9. Reasons for exclusion- Full Text

1) Ineligible population (13)
    a. Incorrect fracture types (8)
        i. Mallet fractures (6)
        ii. Avulsion fractures (2)
    b. Not ORIF (5)
2) Delayed ORIF (>2 weeks from injury) (8)
3) Ineligible outcome (43)
    a. No rehabilitation reported (16)
    b. Inappropriate outcome reported (27)
4) Ineligible study type (3)
5) Duplicated population (2)

Total excluded= 69

Supplementary Table 10. References of included studies

Reference	Study	Citation
1	**Abul 2024**	Abul MS, et al,. The 'Shish-Kebab technique' in intra-articular fractures of the hamate body and concomitant 4th metacarpal base fracture. Eur J Trauma Emerg Surg. 2024; 50(3): p.1083-1092.
2	**Aladin 2005**	Aladin, A. and T.R.C. Davis, Dorsal fracture-dislocation of the proximal interphalangeal joint: A comparative study of percutaneous Kirschner wire fixation versus open reduction and internal fixation. Journal of Hand Surgery. 30(2): p. 120-128.
3	**Al-Qattan 2008**	Al-Qattan, M.M. and K. Al-Zahrani, Open reduction and cerclage wire fixation for long oblique/spiral fractures of the proximal phalanx of the fingers. The Journal of hand surgery, European volume. 33(2): p. 170-173.
4	**Al-Qattan 2010**	Al-Qattan, M.M., Phalangeal neck fractures of the proximal phalanx of the fingers in adults. Injury. 41(10): p. 1084-1090.
5	**Al-Qattan 2011**	Al-Qattan, M.M., Displaced unstable transverse fractures of the shaft of the proximal phalanx of the fingers in industrial workers: reduction and K-wire fixation leaving the metacarpophalangeal and proximal interphalangeal joints free. The Journal of hand surgery, European volume. 36(7): p. 577-583.
6	**Ataker 2017**	Ataker, Y., et al., Early active motion after rigid internal fixation of unstable extra-articular fractures of the proximal phalanx. The Journal of hand surgery, European volume. 42(8): p. 803-809.
7	**Aykut 2015**	Aykut, S., et al., Results of surgical treatment in metacarpal shaft fractures using low profile mini plates. Turkish journal of trauma & emergency surgery: TJTES. 21(4): p. 279-284.
8	**Brazier 1996**	Brazier, J., et al., [Articular fractures of the base of the first metacarpal. Comparative study of direct osteosynthesis and closed pinning]. Annals of hand and upper limb surgery. 15(2): p. 91-99.
9	**Brei-Thoma 2015**	Brei-Thoma, P., E. Vogelin, and T. Franz, Plate fixation of extra-articular fractures of the proximal phalanx: do new implants cause less problems? Archives of orthopaedic and trauma surgery. 135(3): p. 439-4445.
10	**Cha 2019**	Cha, S.M., H.D. Shin, and Y.K. Kim, Comparison of low-profile locking plate fixation versus antegrade intramedullary nailing for unstable metacarpal shaft fractures- A prospective comparative study. Injury. 50(12): p. 2252-2258.
11	**Crawford 1976**	Crawford, G.P., Screw fixation for certain fractures of the phalanges and metacarpals. The Journal of bone and joint surgery. American volume. 58(4): p. 487-492.
12	**Eisenberg 2019**	Eisenberg, G., et al., Clinical Outcomes of Limited Open Intramedullary Headless Screw Fixation of Metacarpal Fractures in 91 Consecutive Patients. Hand (New York, N.Y.). 15(6): p. 793-797.
13	**Gulke 2017**	Gulke, J., et al., Postoperative treatment of metacarpal fractures-Classical physical therapy compared with a home exercise program. Journal of hand therapy : official journal of the American Society of Hand Therapists. 31(1): p. 20-28.
14	**Wong 2010**	Wong, H.C., H.K. Wong, and K.Y. Wong, Stainless Steel 2.0-mm Locking Compression Plate Osteosynthesis System for the Fixation of Comminuted Hand Fractures in Asian Adults. Journal of Orthopaedics, Trauma and Rehabilitation. 15(2): p. 57-61.
15	**Horton 2003**	Horton, T.C., M. Hatton, and T.R.C. Davis, A prospective randomized controlled study of fixation of long oblique and spiral shaft fractures of the proximal phalanx: Closed reduction and percutaneous Kirschner wiring versus open reduction and lag screw fixation. Journal of Hand Surgery. 28(1): p. 5-9.

16	**Roth 2004**	Roth, J.J. and D.M. Auerbach, Fixation of hand fractures with bicortical screws. Journal of Hand Surgery. 30(1): p. 151-153.
17	**Jun 2021**	Jun, D., et al., Controlled active exercise after open reduction and internal fixation of hand fractures. Archives of plastic surgery. 48(1): p. 98-106.
18	**Kamath 2016**	Kamath, J.B., et al., Outcome of unstable fractures of metacarpal and phalangeal bones treated by bone tie. Indian journal of orthopaedics. 50(3): p. 316-321.
19	**Kjaer-Petersen 1992**	Kjaer-Petersen, K., A.G. Jurik, and L.K. Petersen, Intra-articular fractures at the base of the fifth metacarpal: A clinical and radiographical study of 64 cases. Journal of Hand Surgery. 17(2): p. 144-147.
20	**Kose 2018**	Kose, A., et al., Comparison of low-profile plate-screw and Kirschner-wire osteosynthesis outcomes in extra-articular unstable proximal phalangeal fractures. European journal of orthopaedic surgery & traumatology : orthopedie traumatologie. 29(3): p. 597-604.
21	**Krakauer 1996**	Krakauer, J.D. and P.J. Stern, Hinged device for fractures involving the proximal interphalangeal joint. Clinical orthopaedics and related research, (327): p. 29-37.
22	**Kumar 2010**	Kumar, S. and S. Mohanta, Treatment of unstable metacarpal fractures by miniplate and screws. Journal of Clinical Orthopaedics and Trauma. 1(2): p. 66-70.
23	**Kurzen 2006**	Kurzen, P., et al., Complications after plate fixation of phalangeal fractures. The Journal of trauma. 60(4): p. 841-843.
24	**Leclere 2012**	Leclere, F.M.P., et al., 7-year follow-up after open reduction and internal screw fixation in Bennett fractures. Archives of Orthopaedic and Trauma Surgery. 132(7): p. 1045-1051.
25	**Lee 2006**	Lee, J.Y.L. and L.C. Teoh, Dorsal fracture dislocations of the proximal interphalangeal joint treated by open reduction and interfragmentary screw fixation: indications, approaches and results. Journal of hand surgery (Edinburgh, Scotland). 31(2): p. 138-46.
26	**Levy 2018**	Levy, V., M. Mazzola, and M. Gonzalez, Intra-Articular Fracture of the Base of the First Metacarpal Bone: Treatment Through a Volar Approach. Hand (New York, N.Y.). 13(1): p. 90-94.
27	**Li 2014**	Li, Z., et al., Closed reduction external fixator fixation versus open reduction internal fixation in the patients with Bennett fracture dislocation. Chinese medical journal. 127(22): p. 3902-3905.
28	**Miller 2016**	Miller, L., et al., No difference between two types of exercise after proximal phalangeal fracture fixation: a randomised trial. Journal of physiotherapy. 62(1): p. 12-19.
29	**Mumtaz 2010**	Mumtaz, M.U., et al., Unstable metacarpal and phalangeal fractures: treatment by internal fixation using AO mini-fragment plates and screws. Turkish journal of trauma & emergency surgery: TJTES. 16(4): p. 334-338.
30	**Mumtaz 2016**	Mumtaz, M.U., et al., Treatment of Rolando Fractures by Open Reduction and Internal Fixation using Mini T-Plate and Screws. Journal of hand and microsurgery. 8(2): p. 80-85.
31	**Murayama 2022**	Murayama, A., et al., Volar plating versus external fixation for unstable dorsal fracture-dislocations of the proximal interphalangeal joint. The Journal of hand surgery, European volume. 47(3): p. 308-313.
32	**Panthi 2021**	Panthi, S., et al., Open Reduction and Internal Fixation with Mini-plate and Screws for Management of Unstable Metacarpal Fracture among Hand Injuries in a Tertiary Care Center: A Descriptive Cross-sectional Study. JNMA; journal of the Nepal Medical Association. 59(239): p. 653-656.
33	**Pavic 2013**	Pavic, R. and M. Malovic, Operative treatment of Bennett's fracture. Collegium antropologicum. 37(1): p. 169-174.

34	**Poggetti 2021**	Poggetti, A., et al., Outcomes of 173 metacarpal and phalangeal fractures treated by intramedullary headless screw fixation with a 4-year follow-up. The Journal of hand surgery, European volume. 46(5): p. 466-470.
35	**Pomares 2016**	Pomares, G., et al., Bennett fracture: Arthroscopically assisted percutaneous screw fixation versus open surgery: Functional and radiological outcomes. Orthopaedics & traumatology, surgery & research : OTSR. 102(3): p. 357-361.
36	**Prokuski 2001**	Prokuski, L.J. and W.A. Eglseder, Jr., Concurrent dorsal dislocations and fracture-dislocations of the index, long, ring, and small (second to fifth) carpometacarpal joints. Journal of orthopaedic trauma. 15(8): p. 549-554.
37	**Pundkare 2015**	Pundkare, G.T. and A.M. Patil, Carpometacarpal joint fracture dislocation of second to fifth finger. CiOS Clinics in Orthopedic Surgery. 7(4): p. 430-435.
38	**Rubin 2016**	Rubin, G., et al., Complex Dorsal Metacarpophalangeal Dislocation: Long-Term Follow-Up. Journal of Hand Surgery. 41(8): p. e229-e233.
39	**Safoury 2001**	Safoury, Y., Treatment of phalangeal fractures by tension band wiring. Journal of hand surgery (Edinburgh, Scotland). 26(1): p. 50-52.
40	**Sahin 2019**	Sahin, A., M.S. Ayas, and A. Aydin, Outcomes of low-profile plate-screw osteosynthesis in unstable extra-articular fractures of the proximal phalanx. Journal of Experimental and Clinical Medicine (Turkey). 36(4): p. 105-111.
41	**Singh 2019**	Singh, T., et al., Volar Buttress Plating for Unstable Dorsal Fracture-Dislocations of the Proximal Interphalangeal Joint. Journal of hand and microsurgery. 11(2): p. 106-110.
42	**Soni 2011**	Soni, A., et al., Outcome of closed ipsilateral metacarpal fractures treated with mini fragment plates and screws: a prospective study. Journal of orthopaedics and traumatology: official journal of the Italian Society of Orthopaedics and Traumatology. 13(1): p. 29-33.
43	**Souer 2008**	Souer, J.S. and C.S. Mudgal, Plate fixation in closed ipsilateral multiple metacarpal fractures. The Journal of hand surgery, European volume. 33(6): p. 740-744.
44	**Tan 2016**	Tan, E.S. and S.C. Tay, Dorsal Buttress Plate Fixation of Ulnar Carpometacarpal Joint Fracture Dislocations. Techniques in hand & upper extremity surgery. 20(2): p. 77-82.
45	**Tay 2019**	Tay, S.C., M.Q.H. Leow, and E.S. Tan, Use of dorsal buttress plate fixation for ulnar carpometacarpal joint fracture dislocations for early mobilization: outcomes of 11 cases. Musculoskeletal surgery. 103(1): p. 77-82.
46	**Touam 1995**	Touam, C., R. Bleton, and J.Y. Alnot, Surgical treatment of closed articular fractures of proximal interphalangeal joints (20 cases). Annales de Chirurgie de la Main et du Membre Superieur. 14(4): p. 197-201.
47	**Tsai 2022**	Tsai, Y.-J., et al., Hooked embracing plate for Rolando fracture fixation: a preliminary result. BMC surgery. 22(1): p. 419
48	**Uludag 2013**	Uludag, S., et al., Early rehabilitation after stable osteosynthesis of intra-articular fractures of the metacarpal base of the thumb. The Journal of hand surgery, European volume. 40(4): p. 370-373.
49	**Vasilakis 2019**	Vasilakis, V., et al., Extra-articular Metacarpal Fractures: Closed Reduction and Percutaneous Pinning Versus Open Reduction and Internal Fixation. Plastic and reconstructive surgery. Global open. 7(5): p. e2261.
50	**Wolfe 1994**	Wolfe, S.W. and L.D. Katz, Intra-articular impaction fractures of the phalanges. The Journal of hand surgery. 20(2): p. 327-333.
51	**Zhang 2012**	Zhang, B., et al., [Application of AO miniplate and screw in the treatment of metacarpophalangeal joint periarticular fractures]. Zhonghua yi xue za zhi. 92(3): p. 188-191.
52	**Zhang 2018**	Zhang, X., et al., A randomized comparison of bone-cement K-wire fixation vs. plate fixation of shaft fractures of proximal phalanges. The Physician and sportsmedicine. 47(2): p. 189-198.

53 **Zhang Z. 2024** Zhang, Z., D.J. Zhang, and P. Li, Comparison of percutaneous transverse fixation of a Kirschner wire with miniplate placement for treatment of a fifth metacarpal shaft fracture. Chinese Journal of Tissue Engineering Research. 28(30): p. 4842-4847.

Supplementary Table 11. Characteristics of included early mobilisation studies.

Early Mobilisation (23)

Author Year	Study Design	Popul-ation	Location	N	ORIF <2 weeks	Age	% Men	% DH	Fracture Type	Internal Fixation	Immobilisation	PROMs	Objective Clinical Parameters	Total AE	Follow Up	Risk of Bias
Horton 2003	Prospective RCT	Mixed	UK	28	13	26	0.62	0.69	Phalangeal	Screws	Splint	VAS	Grip strength	14	40	Low
Aladin 2005	Prospective RCT	Adults	UK	19	11	37.5	0.82	-	Phalangeal	Mixed	Splint	PEM	Grip strength, TAM, pinch-strength ratio	3	28	Moderate
Zhang 2018	Prospective RCT	Adults	China	107	64	39	0.94	-	Phalangeal	Plate	-	QuickDASH, VAS	TAM, pinch-strength ratio	30	29	Low
Crawford 1976	Prospective cohort	Mixed	USA	21	21	-	0.90	-	Mixed	Mixed	Mixed	-	-	14	11	High
Wolfe 1994	Prospective cohort	Mixed	USA	9	6	26	0.67	0.66	Phalangeal	Tension band	Splint	-	Grip strength	2	21	High
Krakauer 1996	Prospective cohort	Mixed	USA	20	11	31	0.75	0.50	Phalangeal	Mixed	Hinge device	-	TAM	4	14	Moderate
Roth 2004	Prospective cohort	Mixed	USA	36	37	28	0.72	-	Mixed	Screws	Mixed	-	Bone healing	0	13	High
Mumtaz 2010	Prospective cohort	-	Turkey	40	42	28.5	0.73	-	Mixed	Mixed	Splint	-	TAM	14	36	Low

Mumtaz 2016	Prospective cohort	Adults	India	9	9	26	1.00	1.00	Metacarpal	Plate	Splint	VAS	Grip strength, TAM	5	36	High
Ataker 2017	Prospective cohort	Adults	Turkey	22	22	29.7	0.64	0.73	Phalangeal	Mixed	Cast	VAS, DASH	TAM, bone healing	7	15.4	High
Prokuski 2001	Retrospective cohort	Adults	USA	10	10	34	0.60	-	Metacarpal	K-wire	Splint	-	Grip strength	3	36	High
Safoury 2001	Retrospective cohort	Mixed	Egypt	30	28	30	0.57	-	Phalangeal	Tension band	Splint	-	TAM, bone healing	0	27.6	High
Lee 2006	Retrospective cohort	Adults	Singapore	10	7	30	0.80	-	Phalangeal	Screws	Splint	-	-	-	8	High
Kurzen 2006	Retrospective cohort	Adults	Switzerland	54	64	49.9	0.72	-	Phalangeal	Plate	Splint	-	-	0	10	High
Souer 2008	Retrospective cohort	Mixed	USA	19	43	24	0.89	0.84	Metacarpal	Mixed	Cast	-	TAM	3	6	Moderate
Al-Qattan 2011	Retrospective cohort	Adults	Saudi Arabia	35	35	35	1.00		Phalangeal	K-wire	-	-	-	-	-	High
Zhang 2012	Retrospective cohort	Mixed	China	256	302	32.5	-	-	Metacarpal	Mixed	-	QuickDASH	Bone healing	47	4.6	Moderate
Aykut 2015	Retrospective cohort	Mixed	Turkey	29	37	35.1	0.86	-	Metacarpal	Plate	Splint	QuickDASH	Grip strength, TAM	5	32	High
Brei-Thoma 2015	Retrospective cohort	Adults	Switzerland	32	36	45.1	0.47	-	Phalangeal	Plate	Splint	-	TAM	15	10	Moderate

Eisenberg 2019	Retrospective cohort	Mixed	USA	91	91	28	0.87	0.86	Metacarpal	Mixed	Splint	-	Grip strength, TAM	3	-	High
Singh 2019	Retrospective cohort	Mixed	Australia	11	9	35.6	0.82	0.36	Phalangeal	Plate	Splint	QuickDASH	TAM	5	17.3	High
Tay 2019	Retrospective cohort	Adults	Singapore	11	19	31	1.00	0.81	Metacarpal	Plate	Splint	-	Grip strength, TAM, bone healing	5	8.5	Moderate
Tan 2016	Prospective case series	Adults	Singapore	4	3	37	-	-	Metacarpal	Plate	Splint	-	TAM	1	-	High

RCT: randomised control trial; N: total participants in study population; DH: dominant hand; IM: immediate mobilisation; EM: early mobilisation; DM: delayed mobilisation; PROM: patient reported outcome measures; cast: non-removable moulded support; splint: removable support; DASH: Disability of the Arm Shoulder and Hand; VAS: visual analogue scale; QuickDASH: Disability of the Arm Shoulder and Hand, PEM: Patient Evaluation Measure; TAM: total active motion; AE: adverse events; SSI: surgical site infection; Follow up time (months).

Supplementary Table 12. Characteristics of included delayed mobilisation studies.

Delayed Mobilisation (19)

Author Year	Study Design	Popul-ation	Location	N	ORIF <2 weeks	Age	% Men	% DH	Fracture Type	Internal Fixation	Immobilisation	PROMs	Objective Clinical Parameters	Total AE	Follow Up	Risk of Bias
Gulke 2017	Prospective RCT	Adults	Germany	60	60	32	0.75	-	Metacarpal	Plate	Splint	QuickDASH	Grip strength, ROM	1	3	Moderate
Cha 2019	Prospective cohort	Adults	Korea	69	33	40	0.76	0.73	Phalangeal	Plate	Splint	VAS, DASH	Grip strength	4	24	Low
Jun 2021	Prospective cohort	Mixed	Korea	37	37	42	0.81	-	Mixed	Plate	Splint	-	TAM, bone healing	16	16	Low
Abul 2024	Prospective cohort	Mixed	Germany	16	8	27.3 7	1.00	1.00	Metacarpal	Mixed	Splint	QuickDASH, VAS	Grip strength, bone healing	1	3	Moderate
Kjaer-Petersen 1992	Retrospective cohort	Mixed	Denmark	64	19	38	0.77	-	Metacarpal	K-wire	Cast	-	Grip strength	7	48	High
Touam 1995	Retrospective case series	Adults	France	20	20	27.5	0.70	0.40	Phalangeal	Mixed	Splint	Steel's criteria	-	2	45	High
Brazier 1996	Retrospective cohort	Mixed	France	35	35	68	0.94	-	Metacarpal	Mixed	Splint	-	Grip strength, pinch-strength ratio	1	-	High

Kumar 2010	Retrospective cohort	Adults	India	24	16	26	0.96	-	Metacarpal	Plate	Cast	-	-	6	8	High
Leclere 2012	Retrospective cohort	Adults	Switzerland	24	24	40.1	0.79	0.83	Metacarpal	Mixed	Cast	VAS	Grip strength, pinch-strength ratio	11	83	Moderate
Uludag 2013	Retrospective cohort	Mixed	Turkey	16	16	36.4	0.69	-	Metacarpal	Mixed	Splint	VAS, DASH	Grip strength, pinch-strength ratio	-	15.6	High
Li 2014	Retrospective cohort	Adults	China	88	32	34	0.84	-	Metacarpal	Screws	Splint	-	Grip strength, bone healing, pinch-strength ratio	2	84	High
Pundkare 2015	Retrospective case series	Adults	India	6	6	31	1.00	-	Metacarpal	K-wires	Splint	QuickDASH	Bone healing	2	21	High
Pomares 2016	Retrospective cohort	Mixed	France	21	10	30.2	1.00	0.60	Metacarpal	Screws	Splint	-	Grip strength, pinch-strength ratio	1	33.3	High
Levy 2018	Retrospective cohort	Adults	Argentina	21	21	32	0.61	-	Metacarpal	Screws	Cast	QuickDASH, VAS	Grip strength, bone healing	2	8	High
Kose 2018	Retrospective cohort	Adults	Turkey	40	22	39	0.95	-	Phalangeal	Plate	Splint	VAS, DASH	Grip strength, TAM	0	16	High
Vasilakis 2019	Retrospective cohort	Mixed	USA	70	7	48.4	0.85	-	Metacarpal	Plate	Splint	DASH	TAM	0	2.2	Moderate

Sahin 2019	Retrospective cohort	Adults	Turkey	20	20	38.9	0.95	0.45	Phalangeal	Plate	Splint	VAS, DASH	Grip strength, TAM, bone healing	1	16	Moderate
Tsai 2022	Retrospective cohort	Adults	Taiwan	5	5	40.8	0.60	-	Metacarpal	Plate	Splint	-	Grip strength	2	8	High
Panthi 2021	Cross-sectional	Adults	Nepal	250	32	37.7	0.63	-	Metacarpal	Plate	Splint	-	Bone healing	3	6	Low

RCT: randomised control trial; N: total participants in study population; DH: dominant hand; IM: immediate mobilisation; EM: early mobilisation; DM: delayed mobilisation; PROM: patient reported outcome measures; cast: non-removable moulded support; splint: removable support; DASH: Disability of the Arm Shoulder and Hand; VAS: visual analogue scale; QuickDASH: Disability of the Arm Shoulder and Hand, TAM: total active motion; AE: adverse events; SSI: surgical site infection; Follow up time (months).

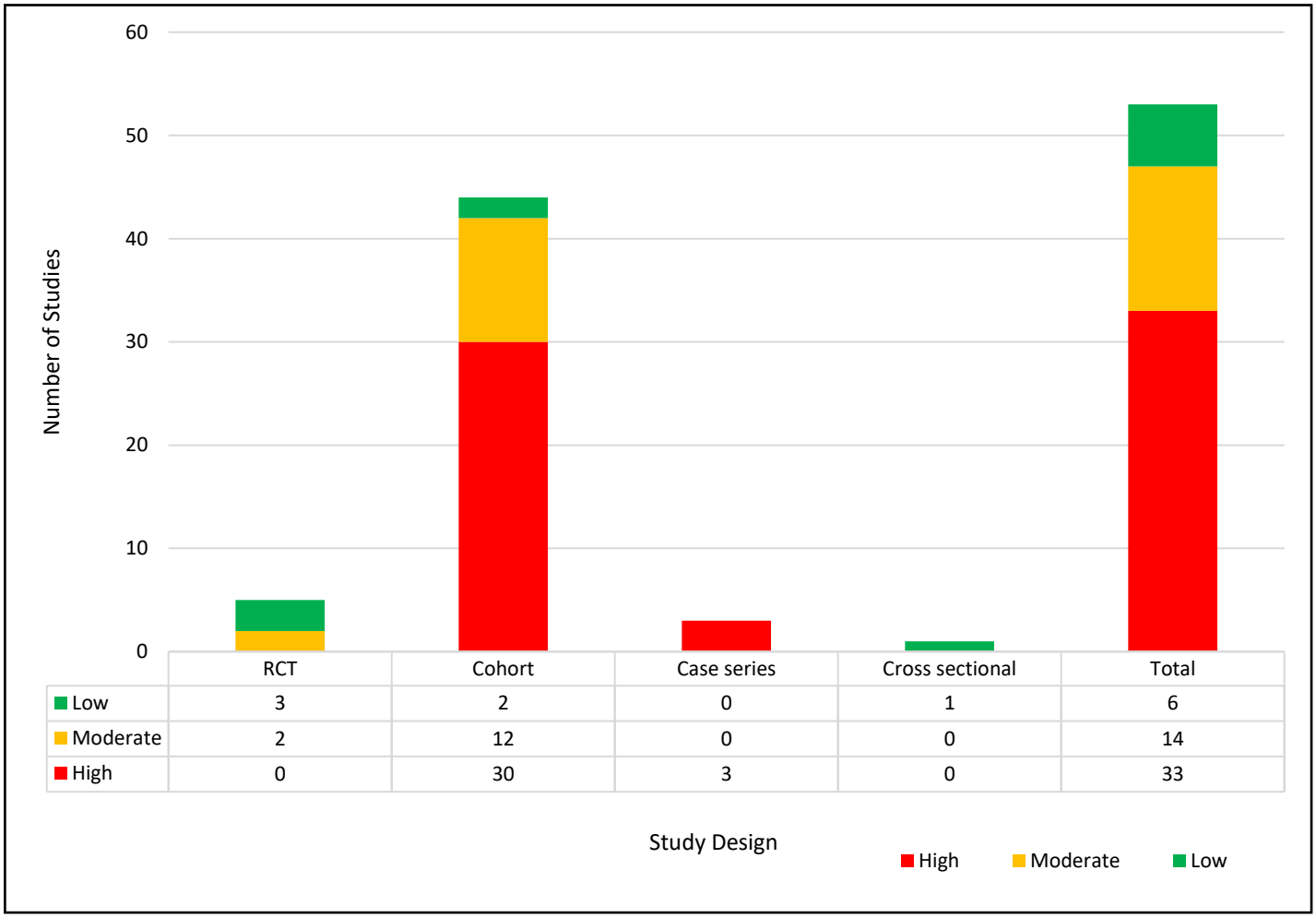
Supplementary Table 13. Summary of PROMs data

Study	Mobilisation	Patients (n)	<6 weeks Mean score	12 weeks Mean score	6 months Mean score	1 year Mean score	>3 years Mean score
QuickDASH							
Rubin, 2016	IM	2	-	-	-	10.3	-
Zhang, 2012	EM	256	-	-	17.4	-	-
Zhang, 2018	EM	107	-	-	-	9.2	-
Singh, 2019	EM	11	-	-	-	13.0	-
Aykut, 2015	EM	29	-	-	-	3.6	-
Abul, 2024	DM	16	18.1	6.6	-	-	-
Gulke, 2017	DM	60	30.0	16.0	-	-	-
Levy, 2018	DM	21	15.0	-	-	-	-
Pundkare, 2015	DM	6	75.8	-	-	-	-
DASH							
Soni, 2011	IM	21	-	-	8.47	-	-
Ataker, 2017	EM	22	-	-	-	9.2	-
Sahin, 2019	DM	20	-	-	7	-	-
Vasilakis, 2019	DM	70	-	-	-	18.7	-
Uludag, 2013	DM	16	-	-	-	13.5	-
Kose, 2018	DM	40	-	-	-	6.5	-
Cha, 2019	DM	69	-	-	-	6.0	-
VAS							
Horton, 2003	EM	28	-	-	-	3.5	-
Zhang, 2018	EM	107	-	-	-	4.0	-
Ataker, 2017	EM	22	-	-	-	0.3	-
Mumtaz, 2016	EM	9	-	-	-	-	0.4
Abul, 2024	DM	16	3.5	1.1	-	-	-
Sahin, 2019	DM	20	-	-	-	0.8	-
Levy, 2018	DM	21	0	-	-	-	-

Uludag, 2013	DM	16	-	-	-	1.1	-
Kose, 2018	DM	40	-	-	-	1.0	-
Cha, 2019	DM	69	-	-	-	0.3	-
Leclere, 2012	DM	24	-	-	-	-	1.4
Hand20							
Murayama, 2022	IM	31	-	-	-	9.0	-
PRWHE							
Miller, 2016	IM	66	33.0	-	-	-	-
Steel's criteria							
Touam, 1995	DM	20	-	-	-	-	14x Excellent/ Good 4x Fair 2x Poor
PEM							
Aladin, 2005	EM	11	-	-	-	-	244.5

IM: immediate mobilisation; EM: early mobilisation; DM: delayed mobilisation; DASH: Disability of the Arm Shoulder and Hand; VAS: Visual Analogue Scale; PRWHE: Patient Rated Wrist/Hand Evaluation; PEM: Patient Evaluation Measure.

Supplementary Figure 14. Risk of Bias of included studies.



	RCT	Cohort	Case series	Cross sectional	Total
Low	3	2	0	1	6
Moderate	2	12	0	0	14
High	0	30	3	0	33

RCT: randomised control trial.

NHLBI Study Assessment conversion: 'Low' RoB ≥ 9 domain criteria. 'Moderate' RoB = 6-8 domain criteria. 'High' RoB < 6 domain criteria or other issues e.g. unreasonably small sample size, invalid conclusions, or missing data, that were not included under the 12 domains.