

## Appendix A

The following searches were originally conducted in December 2018 and updated in June 2021.

### MEDLINE

Interface: OVID.

1. ((shoulder\* or glenohumer\* or subacromi\* or acromi\* or rotator cuff) adj3 (instability or bursitis or frozen or impinge\* or tendonitis or tendinitis or pain\* or osteoarthr\* or periarthriti\* or periarthriti\* or arthralgia)).ti,ab,kw.

2. Shoulder Impingement Syndrome/

3. exp Bursitis/

4. Rotator Cuff/

5. adhesive capsuliti\*.ti,ab,kw.

6. Shoulder Pain/

7. or/1-6

8. exp Pain/

9. pain\*.ti,ab,kw.

10. Arthralgia/

11. arthralgia.ti,ab,kw.

12. or/8-11

13. Shoulder/

14. Shoulder joint/

15. Acromioclavicular Joint/

16. (shoulder\* or glenohumer\* or subacromi\* or acromi\* or rotator cuff).ti,ab,kw.

17. or/13-16

18. 12 and 17

19. 7 or 18

20. exp Diabetes Mellitus/

21. diabet\*.ti,ab,kw.

22. (DMi or DM i).ti,ab,kw.

23. (DM1 or DM 1).ti,ab,kw.

24. (DM2 or DM 2).ti,ab,kw.

25. (DMii or DM ii).ti,ab,kw.

26. (DM adj2 type).ti,ab,kw.

27. or/20-26

28. 19 and 27

29. exp animals/ not humans/

30. 28 not 29

#### EMBASE

Interface: OVID.

1. ((shoulder\* or glenohumer\* or subacromi\* or acromi\* or rotator cuff) adj3 (instability or bursitis or frozen or impinge\* or tendonitis or tendinitis or pain\* or osteoarthr\* or periarthriti\* or peri arthriti\* or arthralgia)).ti,ab,kw.

2. exp shoulder impingement syndrome/

3. exp bursitis/

4. exp rotator cuff/

5. exp humeroscapular periarthritis/

6. adhesive capsuliti\*.ti,ab,kw.

7. exp shoulder pain/

8. or/1-7

9. exp pain/

10. pain\*.ti,ab,kw.

11. exp arthralgia/

12. arthralgia.ti,ab,kw.

13. or/9-12

14. exp shoulder/

15. Acromioclavicular Joint/

16. (shoulder\* or glenohumer\* or subacromi\* or acromi\* or rotator cuff).ti,ab,kw.

17. or/14-16

18. 13 and 17

19. 8 or 18

20. exp Diabetes Mellitus/

21. diabet\*.ti,ab,kw.

22. (DMi or DM i).ti,ab,kw.

23. (DM1 or DM 1).ti,ab,kw.

24. (DM2 or DM 2).ti,ab,kw.

25. (DMii or DM ii).ti,ab,kw.

26. (DM adj2 type).ti,ab,kw.
27. or/20-26
28. 19 and 27
29. exp animals/ not humans/
30. 28 not 29
31. limit 30 to embase

**AMED**

Interface: OVID.

1. ((shoulder\* or glenohumer\* or subacromi\* or acromi\* or rotator cuff) adj3 (instability or bursitis or frozen or impinge\* or tendonitis or tendinitis or pain\* or osteoarthr\* or periarthriti\* or peri arthriti\* or arthralgia)).ti,ab.
2. exp Shoulder impingement syndrome/
3. exp Bursitis/
4. exp Rotator cuff/
5. adhesive capsuliti\*.ti,ab.
6. exp shoulder pain/
7. or/1-6
8. exp Pain/
9. pain\*.ti,ab.
10. exp Arthralgia/
11. arthralgia.ti,ab.
12. or/8-11
13. shoulder/
14. (shoulder\* or glenohumer\* or subacromi\* or acromi\* or rotator cuff).ti,ab.
15. or/13-14
16. 12 and 15
17. 7 or 16
18. exp Diabetes mellitus/
19. diabet\*.ti,ab.
20. (DMi or DM i).ti,ab.
21. (DM1 or DM 1).ti,ab.
22. (DM2 or DM 2).ti,ab.

23. (DMii or DM ii).ti,ab.
24. (DM adj2 type).ti,ab.
25. or/18-24
26. 17 and 25
27. exp animals/ not humans/
28. 26 not 27

**PsycINFO**

Interface: OVID.

1. ((shoulder\* or glenohumer\* or subacromi\* or acromi\* or rotator cuff) adj3 (instability or bursitis or frozen or impinge\* or tendonitis or tendinitis or pain\* or osteoarthr\* or periarthriti\* or peri arthriti\* or arthralgia)).ti,ab.
2. Shoulder Impingement Syndrome.ti,ab.
3. bursitis.ti,ab.
4. rotator cuff.ti,ab.
5. adhesive capsuliti\*.ti,ab.
6. shoulder pain.ti,ab.
7. or/1-6
8. exp PAIN/
9. pain\*.ti,ab.
10. arthralgia.ti,ab.
11. or/8-10
12. \*"shoulder (anatomy)"/
13. shoulder\*.ti,ab.
14. shoulder joint.ti,ab.
15. acromi\*.ti,ab.
16. glenohumer\*.ti,ab.
17. subacromi\*.ti,ab.
18. or/12-17
19. 11 and 18
20. 7 or 19
21. exp DIABETES MELLITUS/
22. diabet\*.ti,ab.

23. (DMi or DM i).ti,ab.  
 24. (DM1 or DM 1).ti,ab.  
 25. (DM2 or DM 2).ti,ab.  
 26. (DMii or DM ii).ti,ab.  
 27. (DM adj2 type).ti,ab.  
 28. or/21-27  
 29. 20 and 28

### Web of Science

Science Citation Index Expanded and the Science Conference Proceedings Citation Index.

((

TS=(Shoulder\* NEAR/3 instability) OR TS=(Shoulder\* NEAR/3 bursitis) OR TS=(Shoulder\* NEAR/3 frozen) OR TS=(Shoulder\* NEAR/3 impinge\*) OR TS=(Shoulder\* NEAR/3 tendonitis) OR TS=(Shoulder\* NEAR/3 tendinitis) OR TS=(Shoulder\* NEAR/3 pain) OR TS=(Shoulder\* NEAR/3 osteoarthr\*) OR TS=(Shoulder\* NEAR/3 periarthriti\*) OR TS=(Shoulder\* NEAR/3 "peri arthriti\*") OR TS=(Shoulder\* NEAR/3 arthralgia)

OR

TS=(glenohumer\* NEAR/3 instability) OR TS=(glenohumer\* NEAR/3 bursitis) OR TS=(glenohumer\* NEAR/3 frozen) OR TS=(glenohumer\* NEAR/3 impinge\*) OR TS=(glenohumer\* NEAR/3 tendonitis) OR TS=(glenohumer\* NEAR/3 tendinitis) OR TS=(glenohumer\* NEAR/3 pain) OR TS=(glenohumer\* NEAR/3 osteoarthr\*) OR TS=(glenohumer\* NEAR/3 periarthriti\*) OR TS=(glenohumer\* NEAR/3 "peri arthriti\*") OR TS=(glenohumer\* NEAR/3 arthralgia)

OR

TS=(subacromi\* NEAR/3 instability) OR TS=(subacromi\* NEAR/3 bursitis) OR TS=(subacromi\* NEAR/3 frozen) OR TS=(subacromi\* NEAR/3 impinge\*) OR TS=(subacromi\* NEAR/3 tendonitis) OR TS=(subacromi\* NEAR/3 tendinitis) OR TS=(subacromi\* NEAR/3 pain) OR TS=(subacromi\* NEAR/3 osteoarthr\*) OR TS=(subacromi\* NEAR/3 periarthriti\*) OR TS=(subacromi\* NEAR/3 "peri arthriti\*") OR TS=(subacromi\* NEAR/3 arthralgia)

OR

TS=(acromi\* NEAR/3 instability) OR TS=(acromi\* NEAR/3 bursitis) OR TS=(acromi\* NEAR/3 frozen) OR TS=(acromi\* NEAR/3 impinge\*) OR TS=(acromi\* NEAR/3 tendonitis) OR TS=(acromi\* NEAR/3 tendinitis) OR TS=(acromi\* NEAR/3 pain) OR TS=(acromi\* NEAR/3 osteoarthr\*) OR TS=(acromi\* NEAR/3 periarthriti\*) OR TS=(acromi\* NEAR/3 "peri arthriti\*") OR TS=(acromi\* NEAR/3 arthralgia)

OR

TS=("rotator cuff" NEAR/3 instability) OR TS=("rotator cuff" NEAR/3 bursitis) OR TS=("rotator cuff" NEAR/3 frozen) OR TS=("rotator cuff" NEAR/3 impinge\*) OR TS=("rotator cuff" NEAR/3

tendonitis) OR TS=("rotator cuff" NEAR/3 tendinitis) OR TS=("rotator cuff" NEAR/3 pain)

OR TS=("rotator cuff" NEAR/3 osteoarthr\*) OR TS=("rotator cuff" NEAR/3 periarthriti\*) OR

TS=("rotator cuff" NEAR/3 "peri arthriti\*") OR TS=("rotator cuff" NEAR/3 arthralgia)

OR

TS=("Rotator cuff")

OR

TS=("Adhesive capsuliti\*")

)

OR

TS=( arthralgia NEAR/3 shoulder\* or arthralgia NEAR/3 glenohumer\* or arthralgia NEAR/3

subacromi\* or arthralgia NEAR/3 acromi\* or arthralgia NEAR/3 "rotator cuff")

OR TS=( pain\* NEAR/3 shoulder\* or pain\* NEAR/3 glenohumer\* or pain\* NEAR/3 subacromi\* or pain\* NEAR/3 acromi\* or pain\* NEAR/3 "rotator cuff")

)

And

TS=(diabet\* or DM1 or "DM 1" or DM2 or "DM 2" or DMi or "DM i" or DMii or "DM ii" or

DM NEAR/2 type)

## CINAHL

Interface: EBSCO. Filters: title or abstract

(

((shoulder\* or glenohumer\* or subacromi\* or acromi\* or "rotator cuff") N3 (instability or bursitis or frozen or impinge\* or tendonitis or tendinitis or pain\* or osteoarthr\* or periarthriti\* or

"peri arthriti\*" or arthralgia))

OR

(MH "Shoulder Impingement Syndrome") OR (MH "Bursitis+") OR (MH "Rotator Cuff+") OR

(MH "Periarthritis") OR (MH "Adhesive Capsulitis+") OR (MH "Shoulder Pain")

OR

((MH "Pain+" or pain or (MH "Arthralgia+") or arthralgia) and ((MH "Shoulder") or (MH

"Acromioclavicular Joint") or shoulder\* or glenohumer\* or subacromi\* or acromi\* or "rotator

cuff")

)

AND

((MH "Diabetes Mellitus+") or diabet\* or (DMi or "DM i") or (DM1 or "DM 1") or (DMii or "DM ii") or (DM2 or "DM 2") or (DM N2 type))

### Epistemonikos

Filters: title or abstract. Primary study. Not an RCT.

((("frozen shoulder" or "shoulder impinge\*" or "shoulder bursitis" or "shoulder tendonitis" or "shoulder tendinitis" or "shoulder pain" or "pain in the shoulder" or "painful shoulder" or "shoulder osteoarthr\*" or "shoulder joint arthr\*" or "shoulder arthr")

OR

("glenohumeral impinge\*" or "glenohumeral bursitis" or "glenohumeral tendonitis" or "glenohumeral tendinitis" or "glenohumeral pain" or "pain in the glenohumeral" or "glenohumeral osteoarthr\*" or "glenohumeral arthr\*" or "glenohumeral arthr")

OR

("subacromial impinge\*" or "subacromial bursitis" or "subacromial tendonitis" or "subacromial tendinitis" or "subacromial pain" or "pain in the subacromial" or "subacromial osteoarthr\*" or "subacromial arthr\*" or "subacromial arthr")

OR

"Rotator cuff"

OR

"periarthriti\*"

OR

"peri arthriti\*"

OR

"Adhesive capsuliti\*"

)

AND

(diabet\* or DM1 or DM2 or DMi or DMii or "type 1 DM" or "type 2 DM" or "type i DM" or "type ii DM")

TRIP

("frozen shoulder" or "shoulder pain" or "periathriti\*" or "peri arthriti\*" or "adhesive capsuliti\*" or "shoulder impingement" or "bursitis" or "rotator cuff") and "diabet\*"

**PEDro**

Filters: body part = upper arm, shoulder or shoulder girdle

Title and abstract search: diabet\*

**Open Grey**

Search 1: Diabet\* and shoulder\*

Search 2: Diabet\* and glenohumer\*

Search 3: Diabet\* and subacromi\*

Search 4: Diabet\* and acromi\*

Search 5: Diabet\* and "rotator cuff"

Search 6: Diabet\* and bursitis

Search 7: Diabet\* and periarthriti\*

Search 8: Diabet\* and "peri arthriti\*"

Search 9: Diabet\* and "adhesive capsuliti\*"

Search 10: Diabet\* and arthralgia

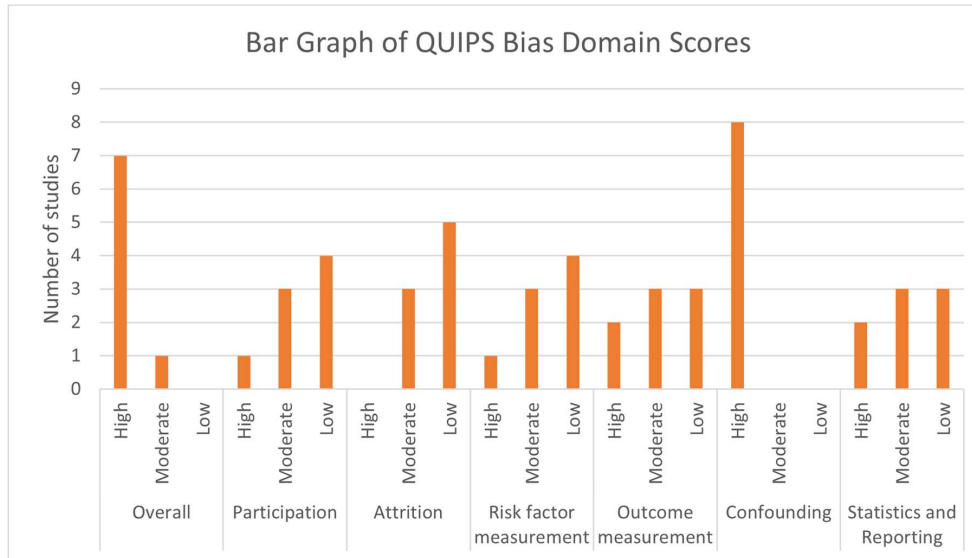
**Grey literature report**

Diabet\*



**Appendix B**

**Fig. B.1** Bar graph of QUIPS scores for each of the six bias domains: study participation, study attrition, diabetes/risk factor (RF) measurement, frozen shoulder/outcome measurement, study confounding, statistical analysis and reporting.



## Appendix C

Table C.1 Raw data from each study.				
Case-Control Studies				
Source	Number of cases	Number of controls	Number of cases with diabetes	Number of controls with diabetes
K. L. Boyle-Walker, et al., 1997 [32]	32	31	7	0
W. Li, et al., 2014 [33]	182	196	44	18
S-Y. Lee, et al., 2012 [34]	40	40	6	1
C. Milgrom, et al., 2008 [35]	126	98	37	11
K. Wang, et al., 2013 [36]	87	176	17	13
K. Kingston, et al., 2018 [37]	2190	2190	572	188
Cohort studies				
Source	Number of people with diabetes	Number of controls	Number of people with diabetes that developed frozen shoulder	Number of people without diabetes that developed frozen shoulder
Y-P. Huang, et al., 2013 [38]	78,827	236,481	946	2254
S-F. Lo, et al., 2013 [39]	5109	20,473	553	768