

Supplementary materials for manuscript entitled:

Surgical complications and their impact on patients' psychosocial wellbeing: A systematic review and meta-analysis

Supplementary material 1: Search strategies

Embase

1. exp mental stress/
2. exp emotion/
3. exp depression/
4. exp ANXIETY/
5. exp posttraumatic stress disorder/
6. exp "quality of life"/
7. exp wellbeing/
8. 1 or 2 or 3 or 4 or 5 or 6 or 7
9. exp surgery/
10. exp complication/
11. 9 and 10
12. exp surgery/co [Complication]
13. exp perioperative complication/
14. exp peroperative complication/
15. exp postoperative complication/
16. exp preoperative complication/
17. exp surgical error/
18. exp iatrogenic disease/su [surgery]
19. exp anesthesia complication/
20. exp ANESTHESIA/co [Complication]
21. exp anesthesia/
22. exp complication/
23. 21 and 22
24. 11 or 12 or 13 or 14 or 15 or 16 or 17 or 18 or 19 or 20 or 23
25. exp patient/
26. adult/
27. female/
28. male/
29. 25 or 26 or 27 or 28
30. 8 and 24 and 29
31. ((psycholog* or psychosocial or psycho-social or psychiatr* or emotion* or feeling* or anxiet* or depressi*2 or posttraumatic stress or post-traumatic stress or PTSD or QOL or quality of life or wellbeing or well-being) adj25 (complication*1 or harm or error*1 or poor outcome or awareness or iatrogen* or ((adverse or unfavourable or unfavorable or untoward or undesired) adj (outcome*1 or effect*1 or event*1 or incident*1 or reaction*1))))).ti,ab.
32. (surg* or post-operative or postoperative or post operative or peri-operative or perioperative or peri operative or per-operative or peroperative or intra-operative or intraoperative or intra operative or anesth* or anaesth*).ti,ab.
33. (patient* or inpatient* or in-patient* or outpatient* or out-patient* or participant* or women or men).ti,ab.
34. 31 and 32 and 33
35. 30 or 34
36. limit 35 to (human and English language)

MEDLINE

1. (psycholog* or psychosocial or psycho-social or psychiatr* or emotion* or feeling* or anxiet* or depressi*2 or posttraumatic or post-traumatic or PTSD or QOL or quality of life or well-being or wellbeing).ti,ab.
2. (surg* or post-operative or postoperative or post operative or peri-operative or perioperative or perioperative or peroperative or per-operative or intra-operative or intraoperative or intra operative or anaesth* or anesth*).ti,ab.
3. (patient* or inpatient* or in-patient* or outpatient* or out-patient* or participant* or women or men).ti,ab.
4. (complication*1 or harm or error*1 or poor outcome or iatrogen* or awareness or ((adverse or unfavourable or unfavorable or untoward or undesired or unanticipated) adj (outcome*1or effect*1 or event*1 or incident*1 or reaction*1))).ti,ab.
5. ((psycholog* or psychosocial or psycho-social or psychiatr* or emotion* or feeling* or anxiet* or depressi*2 or posttraumatic stress or post-traumatic stress or PTSD or QOL or quality of life or wellbeing or well-being) adj25 (complication*1 or harm or error*1 or poor outcome or iatrogen* or awareness or ((adverse or unfavourable or unfavorable or untoward or undesired or unanticipated) adj (outcome*1or effect*1 or event*1 or incident*1 or reaction*1))).ti,ab.
6. 2 and 5
7. 2 and 3 and 5
8. exp Stress, Psychological/
9. exp Emotions/
10. exp Depression/
11. exp Anxiety/
12. exp Stress Disorders, Post-Traumatic/
13. exp "Quality of Life"/
14. 8 or 9 or 10 or 11 or 12 or 13
15. exp Medical Errors/
16. exp Postoperative Complications/
17. exp iatrogenic disease/su [surgery]
18. exp Anesthesia/ae, co [Adverse Effects, Complications]
19. 15 or 16 or 17 or 18
20. 14 and 19
21. exp Patients/
22. exp adult/
23. exp women/
24. exp men/
25. exp research subjects/
26. 21 or 22 or 23 or 24 or 25
27. 14 and 19 and 26
28. 7 or 27
29. limit 28 to (English language and humans)

PsycINFO

1. (psycholog* or psychosocial or psycho-social or psychiatr* or emotion* or feeling* or anxiet* or depressi*2 or posttraumatic or post-traumatic or PTSD or QOL or quality of life or well-being or wellbeing).ti,ab.
2. (surg* or post-operative or postoperative or post operative or peri-operative or perioperative or perioperative or peroperative or per-operative or intra-operative or intraoperative or intra operative or anaesth* or anesth*).ti,ab.
3. (patient* or inpatient* or in-patient* or outpatient* or out-patient* or participant* or women or men).ti,ab.
4. (complication*1 or harm or error*1 or poor outcome or iatrogen* or awareness or ((adverse or unfavourable or unfavorable or untoward or undesired or unanticipated) adj (outcome*1or effect*1 or event*1 or incident*1 or reaction*1))).ti,ab.
5. ((psycholog* or psychosocial or psycho-social or psychiatr* or emotion* or feeling* or anxiet* or depressi*2 or posttraumatic stress or post-traumatic stress or PTSD or QOL or quality of life or wellbeing or well-being) adj25 (complication*1 or harm or error*1 or poor outcome or iatrogen* or awareness or ((adverse or unfavourable or unfavorable or untoward or undesired or unanticipated) adj (outcome*1or effect*1 or event*1 or incident*1 or reaction*1))).ti,ab.
6. 2 and 5
7. 2 and 3 and 5
8. exp Psychological Stress/
9. exp emotions/
10. exp "depression (emotion)"/
11. exp Anxiety/
12. exp posttraumatic stress disorder/
13. exp "Quality of Life"/
14. exp well being/
15. 8 or 9 or 10 or 11 or 12 or 13 or 14
16. exp postsurgical complications/
17. exp patients/
18. exp Human Females/
19. exp human males/
20. 17 or 18 or 19
21. 15 and 16 and 20
22. 7 or 21
23. limit 22 to (human and English language)

Supplementary material 2:

Detailed report of meta-analyses on the impact of complications on patients' psychosocial wellbeing

Quality of life

Due to the different measurement tools that were used for the assessment of QOL as well as the different domains that each tool assesses, a meta-analysis was conducted only on the studies that used the SF-tools. These were the most commonly used tools for the assessment of QoL, they are not condition-specific and they use the same measurement scale. Moreover, all of them yield the same summary scores (i.e. physical and mental).¹ A meta-analysis was conducted on each summary score. The effect sizes are expressed as mean differences (MD) on a scale ranging from 0 to 100.

Only three studies provided sufficient data for a meta-analysis on the SF- physical and mental component scores between patients with complications and patients without complications.²⁻⁴ The pooled mean differences between the two groups indicated significantly lower levels of physical and mental quality of life in patients who suffered complications compared to patients without complications (see eTable1).

The estimates of heterogeneity (I^2) were low (<25%).

Anxiety and Depression

Two studies provided sufficient data for a meta-analysis on anxiety levels.^{5,6} Each study used a different scale, therefore the effect sizes are expressed as standardised mean differences (SMD). The pooled SMD for anxiety was not significant indicating a lack of population effect in terms of the complications' impact on patients' anxiety levels. The estimate of heterogeneity was high ($I^2=81\%$), however a sensitivity analysis by the methodological quality of the included studies did not alter the results. A meta-analysis on depression was not possible as only one study provided sufficient data.⁶

Supplementary material 3

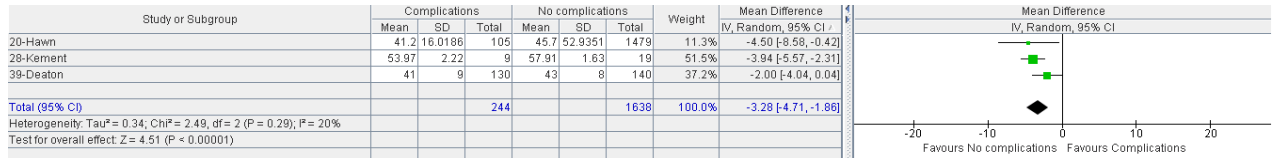
eTable1: Results of meta-analyses on the impact of surgical complications on patient psychosocial outcomes

Wellbeing outcome	Sub-score	Comparison	k	N	Z	P	MD (SMD/anxiety)	95% CI	I ²
Quality of life (SF-scales)	Physical component	Complications vs.	3	244	4.51	0.00001	-3.28	-4.71, -1.86	20%
		No complications		1638					
	Mental component	Complications vs.	3	244	6.52	0.00001	-3.82	-4.97, -2.67	0%
		No complications		1638					
Anxiety		Complications vs.	2	148	1.12	0.26	0.27	-0.21, 0.75	81%
		No complications		262					

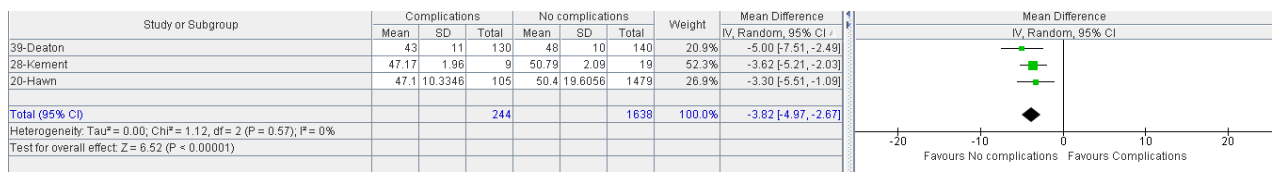
Supplementary material 4:

Forest plots of meta-analyses on the impact of surgical complications on patient psychosocial outcomes

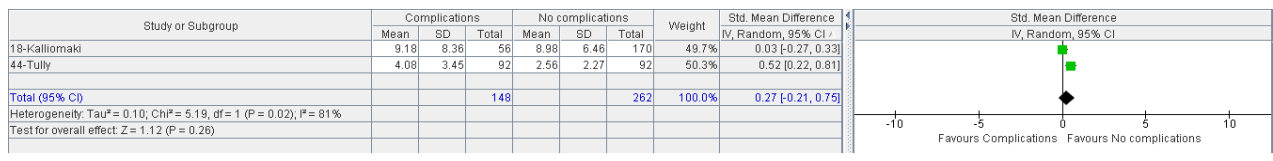
SF Physical summary score (SF PCS)



SF Mental summary score (SF MCS)



Anxiety



References

1. Ware JE, Kosinski M. SF-36 physical & mental health summary scales: a manual for users of version 1: Quality Metric Inc; 2001.
2. Deaton C, Thourani V. Patients with type 2 diabetes undergoing coronary artery bypass graft surgery: Predictors of outcomes. *Eur J Cardiovasc Nur* 2009; **8(1)**: 48-56.
3. Hawn MT, Itani KM, Giobbie-Hurder A, McCarthy Jr M, Jonasson O, Neumayer LA. Patient-reported outcomes after inguinal herniorrhaphy. *Surgery* 2006; **140(2)**: 198-205.
4. Kement M, Karabulut M, Gezen FC, Demirbas S, Vural S, Oncel M. Mild and severe anal incontinence after lateral internal sphincterotomy: Risk factors, postoperative anatomical findings and quality of life. *Eur Surg Res* 2011; **47(1)**: 26-31.
5. Kalliomaki ML, Sandblom G, Gunnarsson U, Gordh T. Persistent pain after groin hernia surgery: A qualitative analysis of pain and its consequences for quality of life. *Acta Anaesth Scand* 2009; **53(2)**: 236-46.
6. Tully PJ, Bennetts JS, Baker RA, McGavigan AD, Turnbull DA, Winefield HR. Anxiety, depression, and stress as risk factors for atrial fibrillation after cardiac surgery. *Heart Lung* 2011; **40(1)**: 4-11.