Supplemental Online Content

Grygorian A, Montano D, Shojaa M, Ferencak M, Schmitz N. Digital health interventions and patient safety in abdominal surgery:
a systematic review and meta-analysis. *JAMA Netw Open*. 2024;7(4):e248555.
doi:10.1001/jamanetworkopen.2024.8555

This supplemental material has been provided by the authors to give readers additional information about their work.

eAppendix. Search strategy

A systematic literature search was conducted through the MEDLINE (via PubMed and OVID), EBM/Cochrane, and Web of Science databases for all articles published up to February 02, 2023.

The search strategy will be utilized the population, intervention and outcome approach. The literature search will be constructed around search terms for “Telemedicine”, “Patient safety”, and “Surgery”.

A standard protocol for this search is being developed and controlled vocabulary (MeSH term for MEDLINE) will be used. We will use Key words and their synonymous to sensitize the search by applying the following concept:

The search strategy for PUBMED

search	Query
#1	Telemedicine[MeSH Terms]
#2	((Telemedicine[Title/Abstract]) OR (Telemedicine[Text Word] OR Telehealth[Text Word] OR "Mobile Health"[Text Word] OR mHealth[Text Word] OR eHealth[Text Word] OR "Digital health"[Text Word] OR Telecommunication*[Text Word] OR "Remote consultation*"[Text Word] OR "Remote monitoring"[Text Word] OR "Health information technology"[Text Word] OR videoconferencing[Text Word] OR "Video?consultation*"[Text Word]))
#3	(“App”[Text Word] OR software[Text Word] OR mobile phone[Text Word] OR smartphone[Text Word] OR cell phone[Text Word] OR "mobile?device" [Text Word])
#4	#1 OR #2 OR #3
#5	Patient Safety[MeSH Terms]
#6	Patient Outcome Assessment[MeSH Terms] OR Outcome Assessment[MeSH Terms]
#7	(“Patient* Safety” [Title/Abstract]) OR (“Patient* Safety”[Text Word] OR “Patient Outcome Assessment”[Text Word] OR Outcome*[Text Word] OR “follow?up”[Text Word] OR prevention[Text Word] OR perioperative[Text Word] OR postoperative[Text Word] OR “Surgical site infection”[Text Word] OR readmission[Text Word] OR Complication*[Text Word] OR disability[Text Word] OR “Adverse events”[Text Word] OR outpatient[Text Word] OR inpatient[Text Word] OR Consequen*[Text Word] OR “After discharge”[Text Word] OR “Post?discharge”[Text Word] OR control[Text Word] OR "Patient* reported" [Text Word])
#8	#5 OR #6 OR #7
#9	General surgery[MeSH Terms]
#10	(“Surgery” [Title/Abstract]) OR (“Abdominal surgery”[Text Word] OR Abdominal[Text Word] OR Gynecolog*[Text Word] OR Colorectal[Text Word] OR Hernia[Text Word] OR Bariatric[Text Word] OR “Weight?loss”[Text Word] OR Coloproctolog*[Text Word] OR “Abdominal wall”[Text Word] OR Laparoscop*[Text Word] OR “surgical procedure*”[Text Word] OR “surgical operation*”[Text Word] OR operative[Text Word])
#11	#9 OR #10
#12	#4 AND #8 AND #11

eMethods.

For LOS (secondary outcome), standardized mean differences (SMD) were calculated between the treatment and control groups.

We used the standardized mean differences, instead of the raw differences, because the scale of measurement differed across studies, e.g., some reported hours, others number of nights. The SMD ensures comparability across studies.

To calculate SMD, the mean difference between the treatment and control groups in each study should be divided by that study's standard deviation[33].

The SMD can be easily interpreted in terms of any LOS scale as the product d*SD, where SD is the standard deviation of the LOS scale (e.g., hours, days, etc).

The meta-analytic RR estimates and the corresponding 95% confidence intervals were obtained with a random-effects model and Mantel– Haenszel test. Der Simonian-Laird estimates were used as the default option of the RevMan software.

There are several methods to estimate the random-effects models. Despite the existing criticism of the Der Simonian-Liard method, studies comparing different methods (Hunter-Schmidt, restricted maximum likelihood REML, Sidik-Jonkman, etc.) have shown that Der Simonian estimator is not per se inappropriate[34,35]

For our study we found concordant results for several estimators. Here we just report as an illustration the REML and the Sidik-Jonkman (SJ) estimators, both with the Knapp and Hartung method for the test statistic and confidence interval:

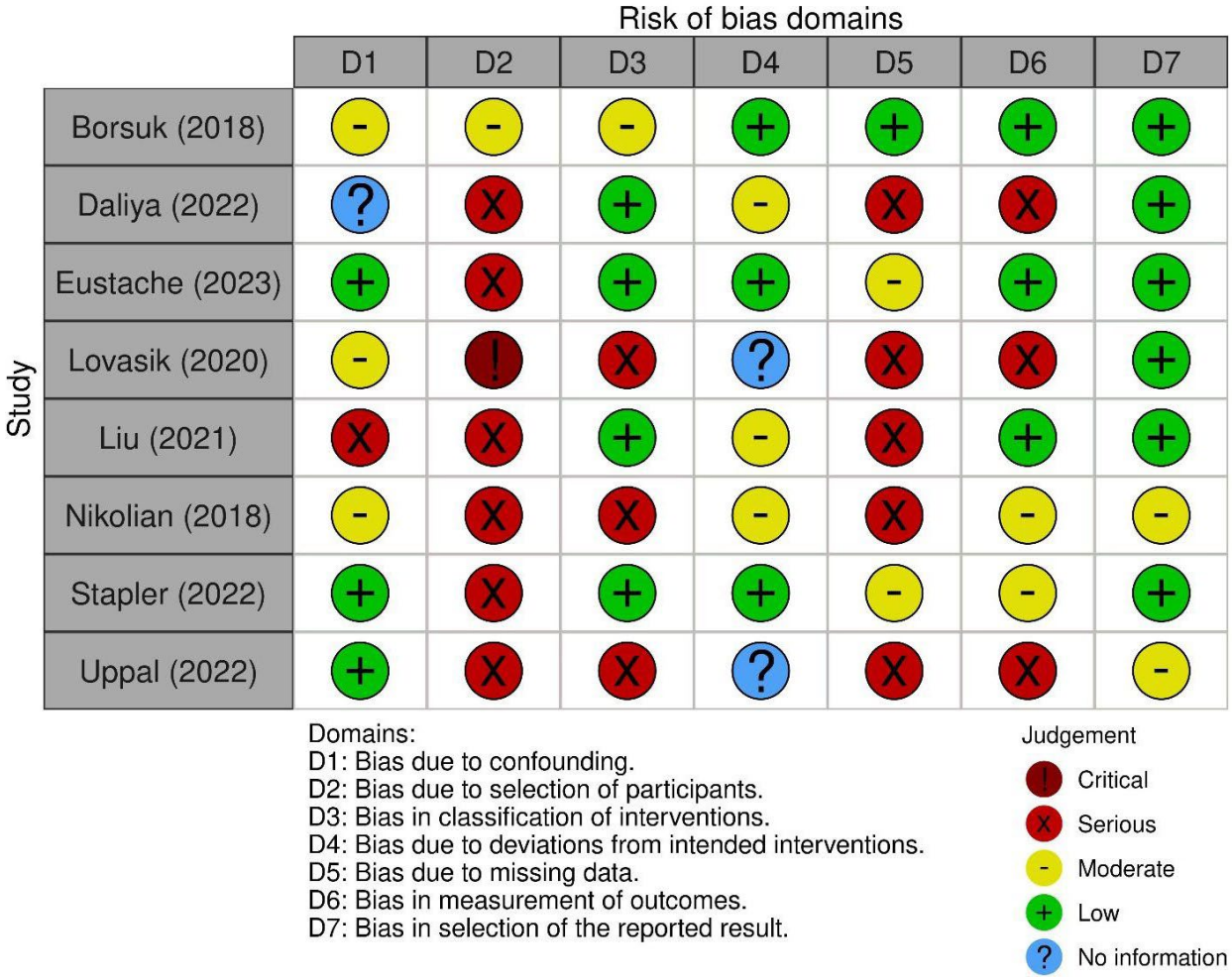
Complications:
Der Simonian (as reported in the manuscript): 1.05 [0.77-1.43]; REML: 1.04 [0.73-1.49]; SJ: 1.04 [0.73-1.49].

Readmissions:
Der Simonian (as reported in the manuscript): 0.67 [0.58-0.78]; REML: 0.69 [0.58-0.81]; SJ: 0.7 [0.59-0.82]

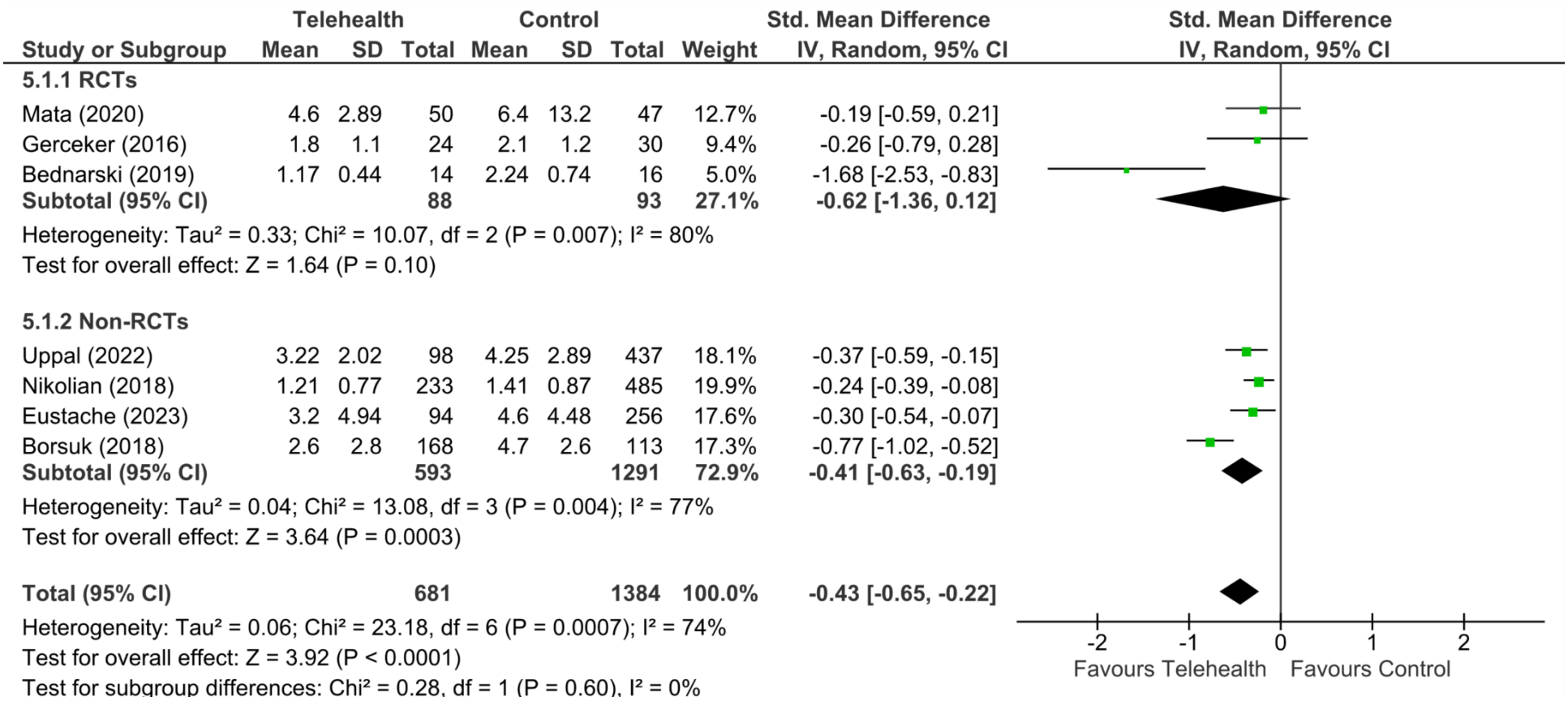
Since the numerical differences are very small and they do not affect the conclusions, we opted for leaving the defaults of the RevMan software.

Study ID	*Eligibility*	*Random allocation*	*Concealed allocation*	*Baseline comparability*	*Blinding subjects*	*Blinding therapists*	*Blinding assessors*	*Completed follow-up*	*Intention to treat concept*	*Between-group comparisons*	*Point estimated variability*	***PEDro score***
Mata (2020)	yes	1	1	1	0	1	1	1	1	1	1	**9**
VanDerMeij (2018)	yes	1	1	1	1	0	1	1	1	1	1	**9**
Dahlberg/Jaensson (2017)	yes	1	1	1	0	0	1	1	1	1	1	**8**
McGilion (2021)	yes	1	1	1	0	0	1	1	1	1	1	**8**
Young (2018)	yes	1	1	1	1	0	0	1	1	1	1	**8**
Cremades (2020)	yes	1	1	1	0	0	0	1	1	1	1	**7**
Bednarsky (2019)	yes	1	1	1	0	0	0	1	1	1	1	**7**
Thompson (2019)	yes	1	1	1	0	0	0	1	1	1	1	**7**
Halder (2022)	yes	1	0	1	0	0	0	1	1	1	1	**6**
Lee (2021)	yes	1	0	1	0	0	0	1	1	1	1	**6**
Pooni (2022)	yes	1	0	1	0	0	0	1	1	1	1	**6**

eFigure 1. RCTs risk of bias assessment (PEDro scale)



eFigure 2. Non-RCTs risk of bias assessment (ROBINS-I tool).



eFigure 3. Length of hospital stay of all studies and subgroups

eTable 1. Number needed to treat, randomized controlled studies.

Readmissions									
	Readmissions	**No readmissions**	**Margins**	**Absolute risk**	**RR[a] control vs. telemedicine**	**Inverse RR**	**ARR[b] % Telemedicine-control**	**NNT[c]**	**Confidence interval NNT**
Control	116	805	921	0,13	1,27	0,78	2,7	37	[17; -640]
Telemedicine	93	848	941	0,10					
ED visits									
	ED visits	**No ED visits**	**Margins**	**Absolute risk**	**RR control vs. telemedicine**	**Inverse RR**	**ARR % Telemedicine – control**	**NNT**	**Confidence interval NNT**
Control	297	1163	1460	0,20	1,35	0,74	5,2	19	[12; 40]
Telemedicine	216	1215	1431	0,15					

[a]RR – relative risk, [b]ARR – absolute risk reduction [c]NNT - number needed to treat

eTable 2. Patient satisfaction

Study ID	*Type of measure*	*Telehealth*	*Control*	*P-value*
Bednarski (2019)	20-question survey a multiple aspect of the perioperative care pathway. Overall satisfaction - number of patients answer "very satisfied", n (%) _	12 (92.3)	12 (85.7)	1
Cremades (2020)	UK NHS outpatient's questionnaire combined with the TUQ (Telehealth usability questionnaire). All the patients were asked to provide a global satisfaction score on a scale from 1 to 5. Median (range),	5 (1-5)	5 (2-5)	0.099
Eustache (2023)	Qualitative survey of app usability and satisfaction with 1 to 10 scale. How likely patients were to recommend the app to another patient undergoing surgery, patients scored the app, mean (SD)	9.4 (1.5)	na	na
Fink (2022)	Satisfaction level measured with 5-point Likert-scale, survey include 6 questions (satisfaction with surgery, with follow-up method, prefer another method, timing of consultation, recommendations to friends, overall satisfaction. Overall, % of satisfied	60%	49%	0.318
Goedeke (2018)	Satisfaction measured with a six-step scale "I was very satisfied with the consultation": 1 = strongly disagree, 6 = strongly agree, mean (95% CI)	5.40 (5.28-5.52)	5.10 (4.92-5.28)	0.029
Halder (2022)	Preoperative Preparedness Questionnaire (PPQ) question number 11 (Q11), "Overall, I feel prepared for my upcoming surgery." n (%) of patients feel prepared for surgery.	52 (83)	41 (59)	< 0.01
Lee (2021)	Patient Satisfaction Questionnaire-18, Mean (SD)	4.5 (0.4)	4.4 (0.4)	0.5
Ma (2018)	Satisfaction level was measured on a non-validated scale from 0 to 10 (0: completely unsatisfied, 5: neutral, 10: completely satisfied), mean (SD),	9.31 (1.31)	8.85 (1.36)	0.002
Mata (2020)	Questionnaire consists of 4 items from the Consumer Assessment of Healthcare Providers and Systems Surgical Care Survey (S-CAHPS), 1 to 5 scale, median (range)	4 (4-5)	4 (3.5-5)	0.7
Nikolian (2018)	eClinic Patient Experience Survey Results (Listed as Percent ''Satisfied'' and ''Very Satisfied'' on a 5-point Scale), n=34, overall satisfaction	83%	na	na
Pooni (2022)	Satisfaction with the discharge process, 10-points scale median (IQR)	9 (8-10)	8 (7-9)	< 0.001
Thompson (2019)	S-CHAPS questionnaire, rating of the surgeon: percentage of respondents giving a "top box" answer to the S-CAHPS questionnaires, % (95 CI) with a non-inferiority limit of 36.1	48.9 (38.4 - 59.4)	51.1 (4.06 - 61.6)	0.006
Vandermeij (2018)	Satisfaction of overall received care, questionnaire on a scale 1 to 10, Mean (SD)	7.5 (1.7)	7.1 (2.3)	0.169
Young (2013)	Quantitative survey. Number of patients satisfied by assistance of research nurse, n (%)	259 (79.4)	na	na

eTable 3. Subgroup analysis by type of intervention

	Weight	*RR (95% CI) Telemedicine vs control*	*Heterogeneity*
1. Readmissions			
1.1 Telemedicine consultation	53.2%	0.74 [0.60, 0.90]	Tau² = 0.00; Chi² = 2.52, df = 6 (P = 0.87); I² = 0%
1.2 Telemedicine App	46.8%	0.66 [0.47, 0.93]	Tau² = 0.04; Chi² = 4.65, df = 3 (P = 0.20); I² = 36%
Total	100.0 %	0.67 [0.58, 0.78]	Tau² = 0.00; Chi² = 8.71, df = 10 (P = 0.56); I² = 0%
			Subgroup differences: Chi² = 0.28, df = 1 (P = 0.60), I² = 0%
2. ED Visits			
2.1 Telemedicine consultation	59.7%	0.81 [0.62, 1.06]	Tau² = 0.07; Chi² = 15.65, df = 7 (P = 0.03); I² = 55%
2.2 Telemedicine App	40.3%	0.74 [0.58, 0.94]	Tau² = 0.02; Chi² = 5.60, df = 4 (P = 0.23); I² = 29%
Total	100.0 %	0.78 [0.65, 0.94]	Tau² = 0.04; Chi² = 22.40, df = 12 (P = 0.03); I² = 46%
			Subgroup differences: Chi² = 0.28, df = 1 (P = 0.60), I² = 0%

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