Non-pharmacological management for delirium in critically ill patients

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HSC Public Health Agency
Research and Development

Overview

- Background and rationale
- Methods
- Results
  - RCTs and NRCTs
  - Qualitative
- Conclusion

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Delirium

- **Disturbance in attention**
- Develops rapidly
- **Acute change from baseline** attention & awareness
- Fluctuates throughout the day
- **Change in cognition** not explained by pre-existing neurocognitive condition
- No evidence that disturbance is due to drug, toxin or medical condition

DSM 5, 2013, p. 127

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Delirium in critical illness

- High incidence in critically ill patients
- 70% missed w/o screening
- Serious negative outcomes
- Non-pharmacological interventions effective in hospitalised patients

Page, Crit Care, 2009, 13 (1):R16
Inouye, NEJM, 1999; 340 (9):669-76.
Ely, JAMA 2004; 291 (14):1753-62
Pandharipande, NEJM, 2013, 369 (14):1306-16

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PAD guidelines

4. Delirium prevention

   1. The task force recommends performing early mobilization of adult ICU patients whenever feasible to reduce the incidence and duration of delirium. **(+1B)**

Clinical Practice Guidelines for the Management of Pain, Agitation, and Delirium in Adult Patients in the Intensive Care Unit

Juliana Barr, MD, FCCM[1]; Gilles L. Fraser, PharmD, FCCM[2]; Kathleen Puntillo, RN, PhD, FAAN, FCCM[3];

5. Delirium treatment

   1. There is no published evidence that treatment with haloperidol reduces the duration of delirium in adult ICU patients. **(No Evidence)**

Brenda Pun, MSN, RN, ACNP[19]; Yoanna Skrobik, MD, FRCP[20]; Roman Jaeschke, MD[21]

Barr; Crit Care Med, 2013, 41 (1):263-306

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Research question

Which non-pharmacological interventions are effective at reducing the incidence and/or duration of delirium in critically ill patients?

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Protocol

Bannon *et al. Systematic Reviews* (2016) 5:75
DOI 10.1186/s13643-016-0254-0

Systematic Reviews

PROTOCOL Open Access

Impact of non-pharmacological interventions on prevention and treatment of delirium in critically ill patients: protocol for a systematic review of quantitative and qualitative research

Leona Bannon[1*], Jennifer McGaughey[2], Mike Clarke[3], Daniel Francis McAuley[1] and Bronagh Blackwood[1]

Methods

- Search history:
  - Databases
  - Grey literature
  - Hand searching & expert recommendations
- Two reviewers
- Screening on title/abstract
- Full text review

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Inclusion criteria

- Participants

  - Critically ill adults and children requiring ICU/ HDU support

- Types of studies

  - RCTS and NRCTs

  - Qualitative studies

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Exclusion criteria

- Participants receiving post ICU/HDU care
- Interventions that require specialist staff/ equipment
- Case reports or case series

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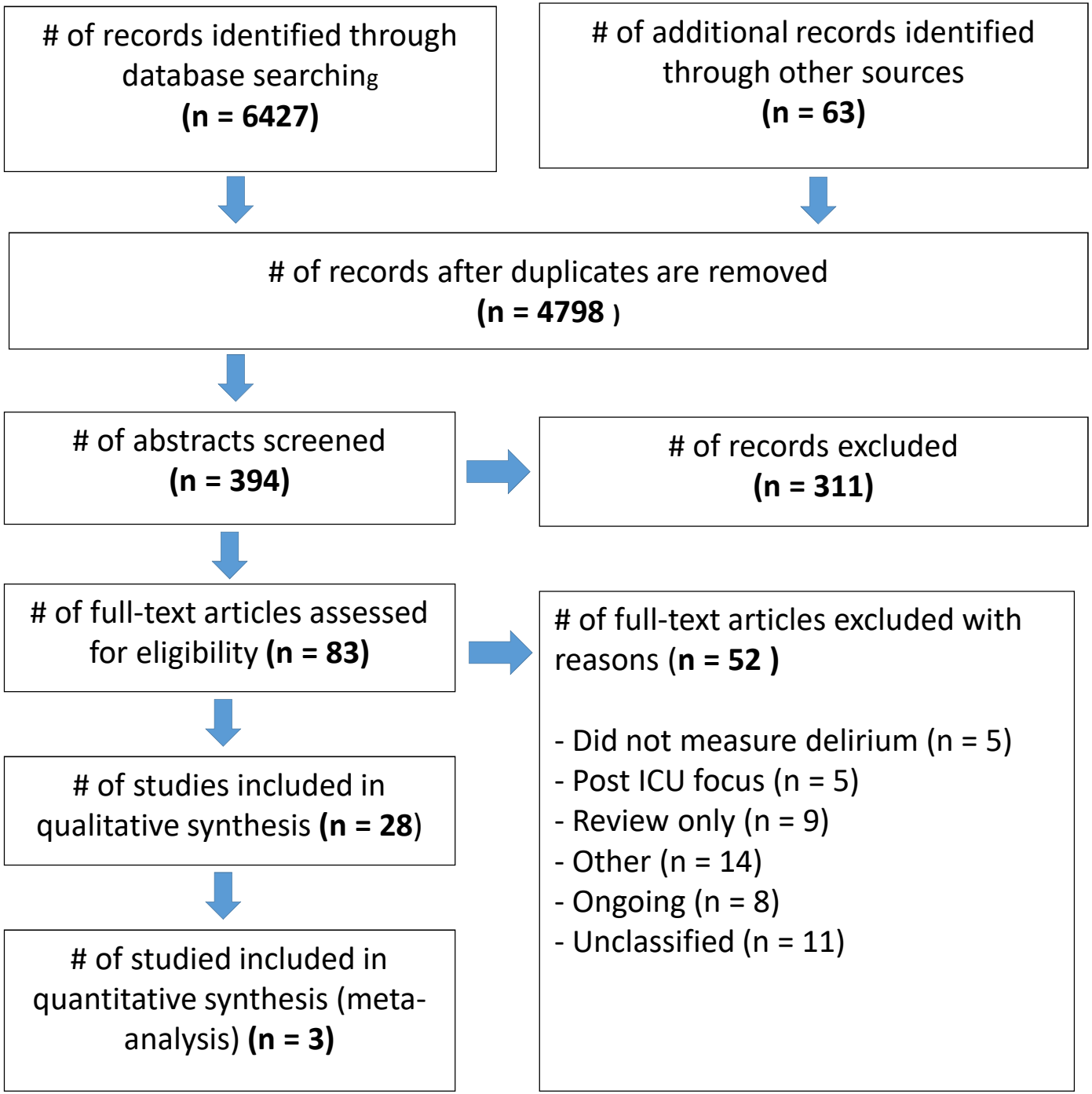
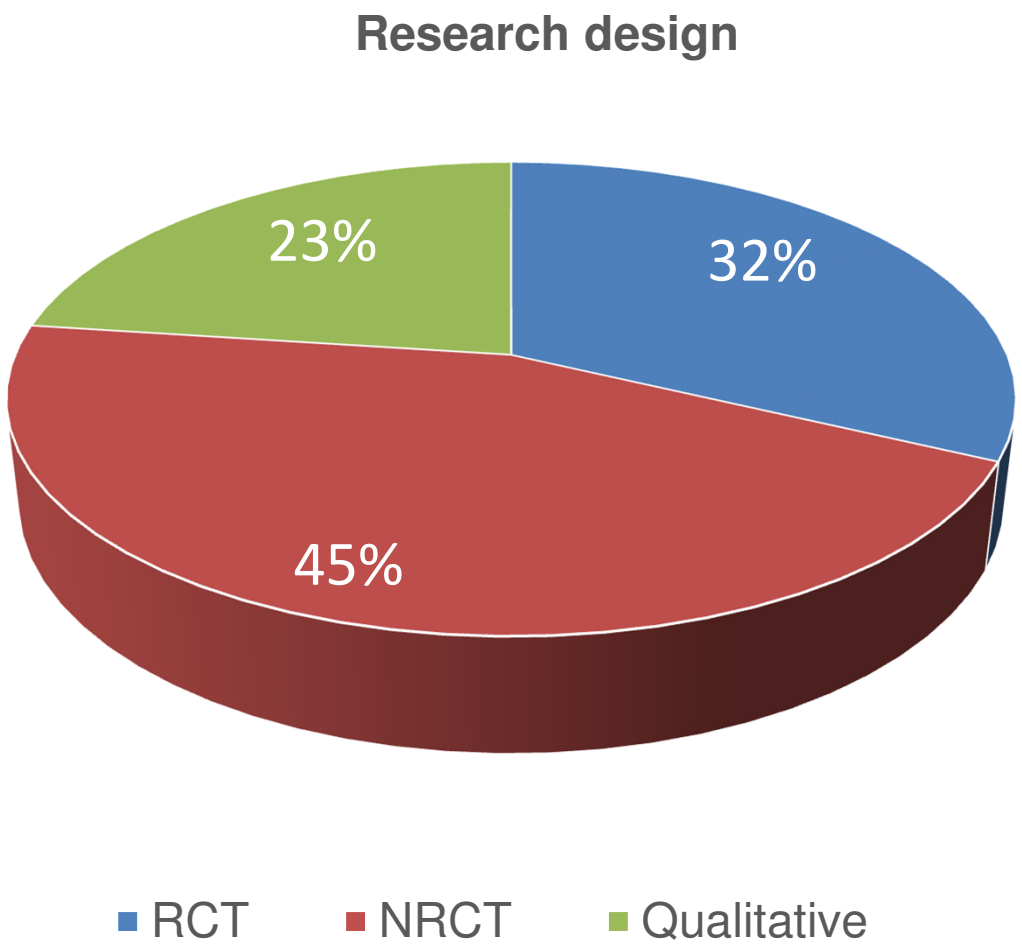
PRISMA Study flow diagram



Characteristics of studies



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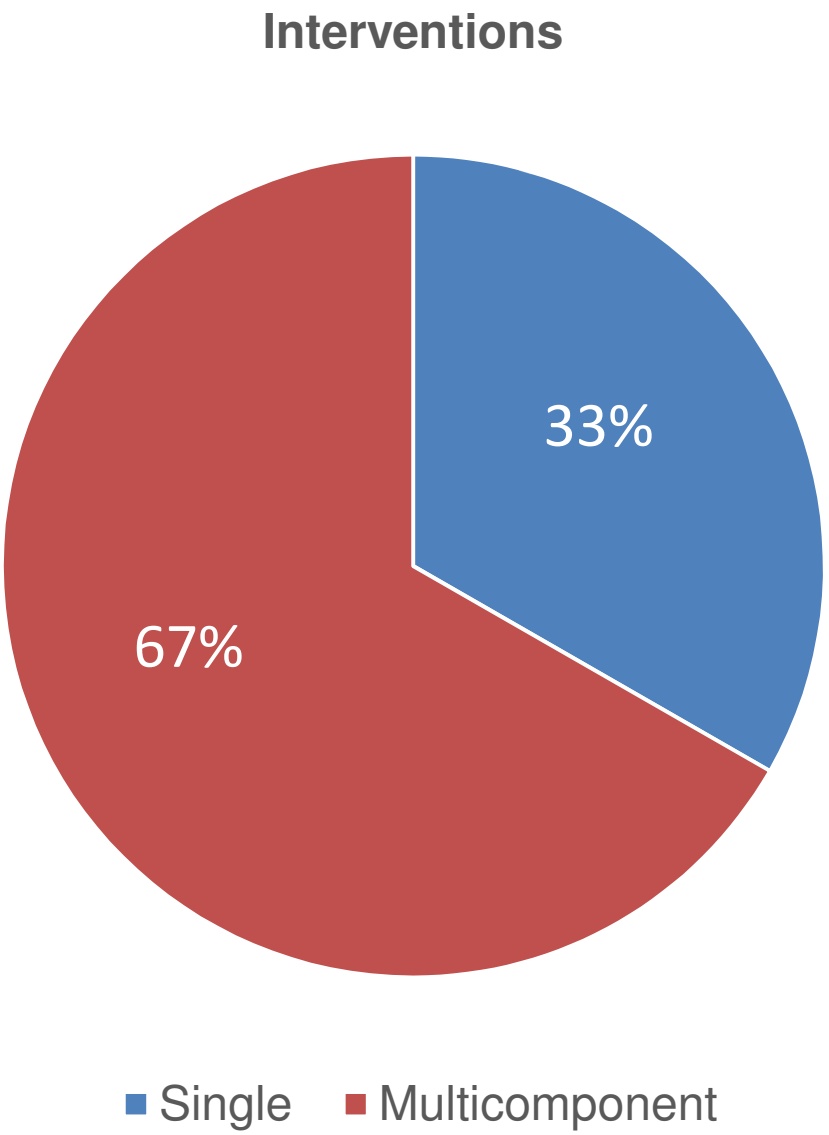
Characteristics of studies



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Results

- Large heterogeneity
- Meta-analyses (3)
- RCT & NRCTs presented separately
- Outcomes
  - Incidence of delirium
  - Duration of delirium
  - ICU mortality
  - Hospital mortality
  - Adverse events
  - Sleep quality

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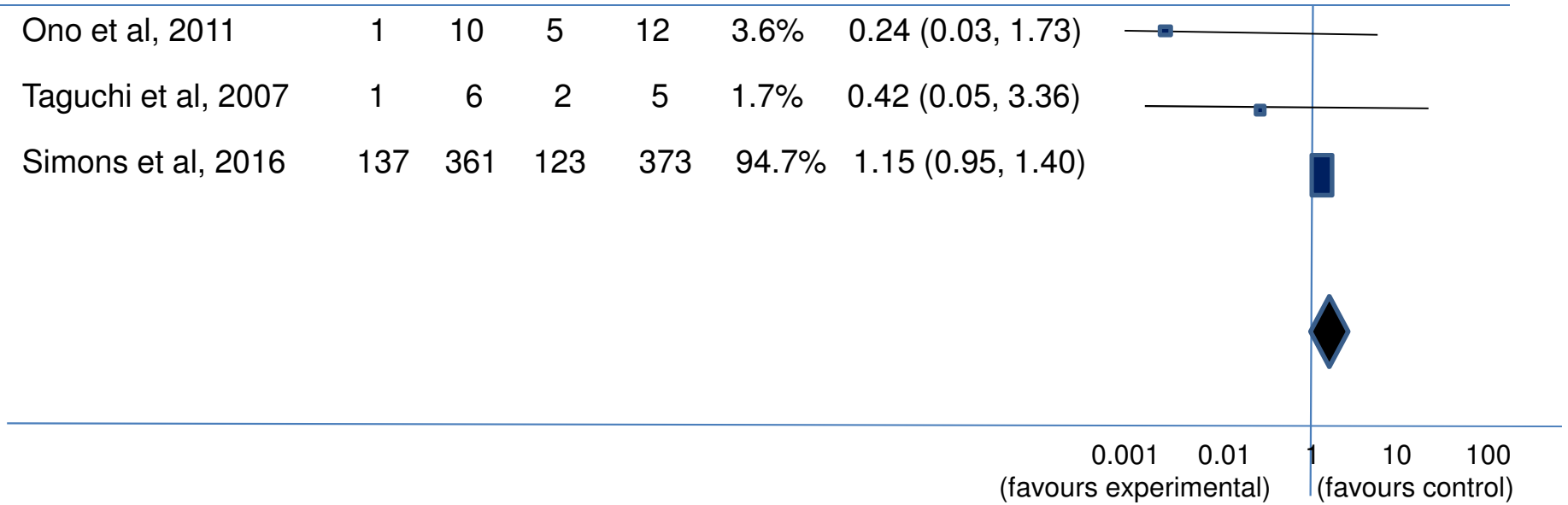
Bright light therapy

Study or subgroup.	BLT Events	BLT Total.	Control. Events	Control. Total.	Weight.	Risk Ratio M-H, Fixed, 95% CI
Ono et al, 2011	1	10	5	12	3.6%	0.24 (0.03, 1.73)
Taguchi et al, 2007	1	6	2	5	1.7%	0.42 (0.05, 3.36)
Simons et al, 2016	137	361	123	373	94.7%	1.15 (0.95, 1.40)



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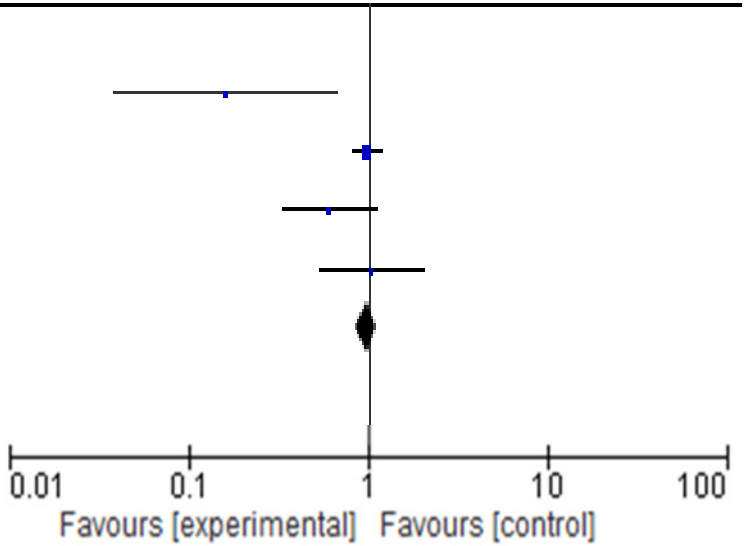
Incidence of delirium (RCTs)

Study or Subgroup	Experimental Events	Total	Control Events	Total	Weight	Risk Ratio M-H, Fixed, 95% CI
1.7.1 Randomised studies						
Alvarez et al, 2013	2	65	13	65	1.4%	0.15 [0.04, 0.65]
Mehta et al, 2012	113	214	113	209	12.4%	0.98 [0.82, 1.17]
Moon et al, 2015	12	60	21	63	2.2%	0.60 [0.32, 1.11]
Van Rompaey et al, 2012	14	69	13	67	1.4%	1.05 [0.53, 2.06]
Subtotal (95% CI)		**785**		**794**	**31.4%**	**0.97 [0.86, 1.11]**
Total events	280		290			



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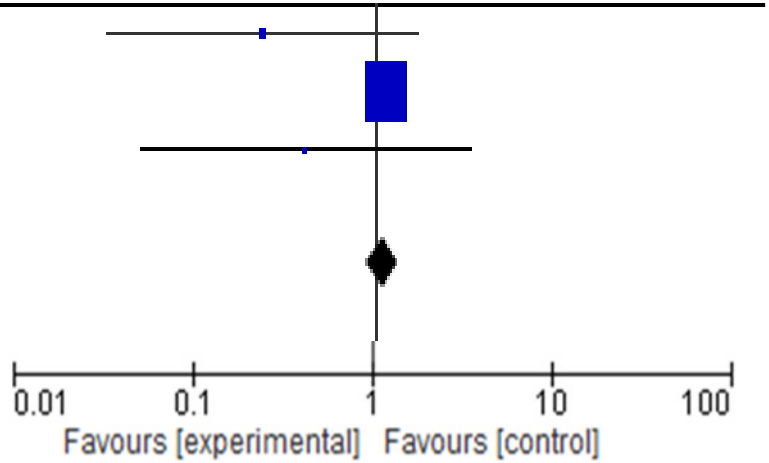
Bright light therapy

Study or Subgroup	Experimental Events	Experimental Total	Control Events	Control Total	Weight	Risk Ratio M-H, Fixed, 95% CI
Ono et al, 2011	1	10	5	12	3.6%	0.24 [0.03, 1.73]
Simons et al, 2016	137	361	123	373	94.7%	1.15 [0.95, 1.40]
Taguchi et al, 2007	1	6	2	5	1.7%	0.42 [0.05, 3.36]
Total (95% CI)		**377**		**390**	**100.0%**	**1.11 [0.91, 1.34]**
Total events	139		130			



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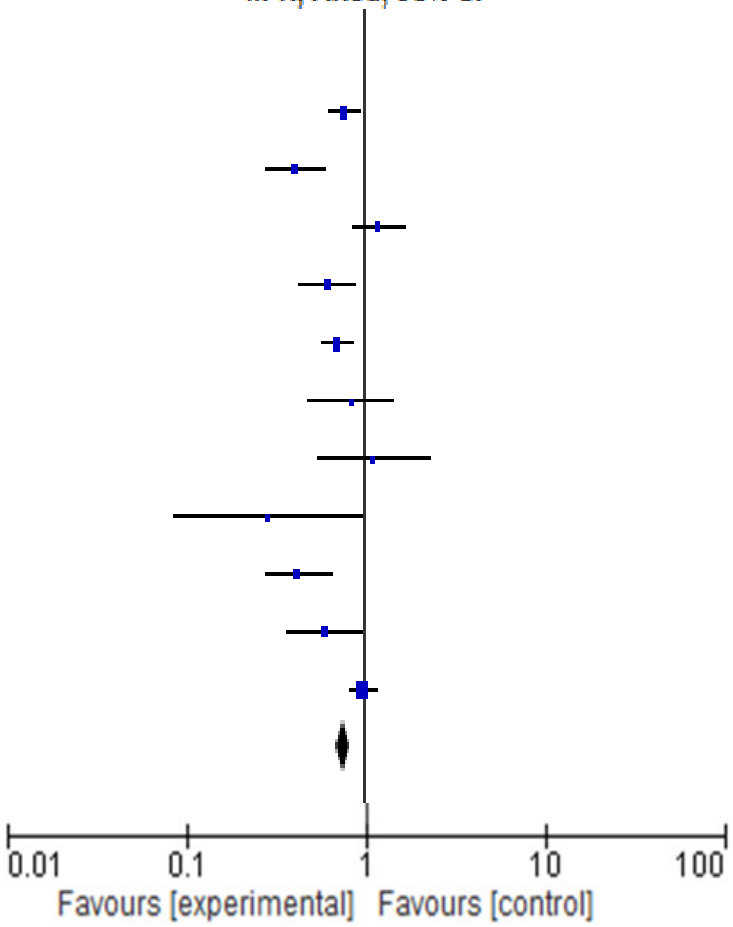
Incidence of delirium (NRCTs)

Study or Subgroup	Experimental Events	Experimental Total	Control Events	Control Total	Weight	Risk Ratio M-H, Fixed, 95% CI
1.7.2 Non-randomised studies						
Balas et al, 2014	73	150	91	146	10.0%	0.78 [0.63, 0.96]
Black et al, 2011	23	87	54	83	6.0%	0.41 [0.28, 0.60]
Bryczkowski et al, 2014	38	66	27	57	3.2%	1.22 [0.86, 1.71]
Colombo et al, 2012	32	144	60	170	6.0%	0.63 [0.44, 0.91]
Kamdar et al, 2013	86	175	76	110	10.2%	0.71 [0.58, 0.87]
Khan et al, 2014	33	168	14	61	2.2%	0.86 [0.49, 1.49]
Lee et al, 2012	7	13	7	15	0.7%	1.15 [0.55, 2.42]
Parry et al, 2014	2	8	7	8	0.8%	0.29 [0.08, 0.98]
Patel et al, 2014	24	171	55	167	6.1%	0.43 [0.28, 0.65]
Rivosecchi et al, 2015	24	253	36	230	4.1%	0.61 [0.37, 0.98]
Shrobik et al, 2010	177	517	176	508	19.3%	0.99 [0.83, 1.17]
Subtotal (95% CI)		**1752**		**1555**	**68.6%**	**0.76 [0.69, 0.84]**
Total events	519		603			



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Duration of delirium (RCTs)

- 2 RCTs
- 1 RCT
  - Reduced days of delirium & % of time delirious
  - Intervention group

Duration of delirium (NRCTs)

- 5 NRCTs
  - Reduction in days of delirium
  - Reduction in % of days delirious
  - Post implementation
- One single component
- 4 multicomponent

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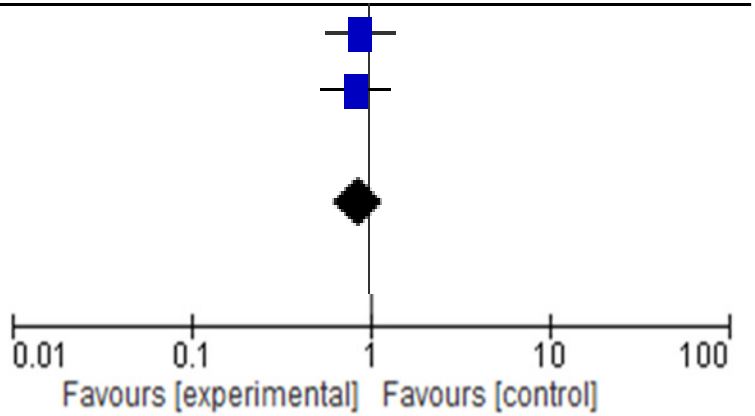
ICU mortality- RCTs

Study or Subgroup	Experimental Events	Experimental Total	Control Events	Control Total	Weight	Odds Ratio M-H, Random, 95% CI
Mehta et al, 2012	50	214	52	209	49.0%	0.92 [0.59, 1.44]
Simons et al, 2016	43	354	50	360	51.0%	0.86 [0.55, 1.33]
Total (95% CI)		**568**		**569**	**100.0%**	**0.89 [0.65, 1.21]**
Total events	93		102			



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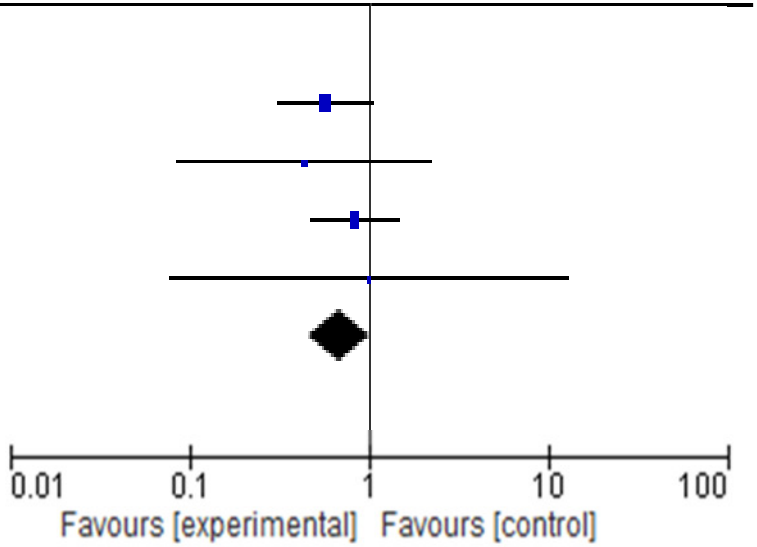
ICU mortality- NRCTs

Study or Subgroup	Experimental Events	Experimental Total	Control Events	Control Total	Weight	Odds Ratio M-H, Random, 95% CI
1.8.2 NRCTs						
Balas et al, 2014	14	150	24	146	17.4%	0.57 [0.31, 1.05]
Bryczkowski et al, 2014	2	66	4	57	3.1%	0.43 [0.08, 2.27]
Kamdar et al, 2013	24	175	18	110	15.8%	0.84 [0.48, 1.47]
Parry et al, 2014	1	8	1	8	0.7%	1.00 [0.07, 13.37]
Subtotal (95% CI)		**399**		**321**	**36.9%**	**0.68 [0.46, 1.01]**
Total events	41		47			



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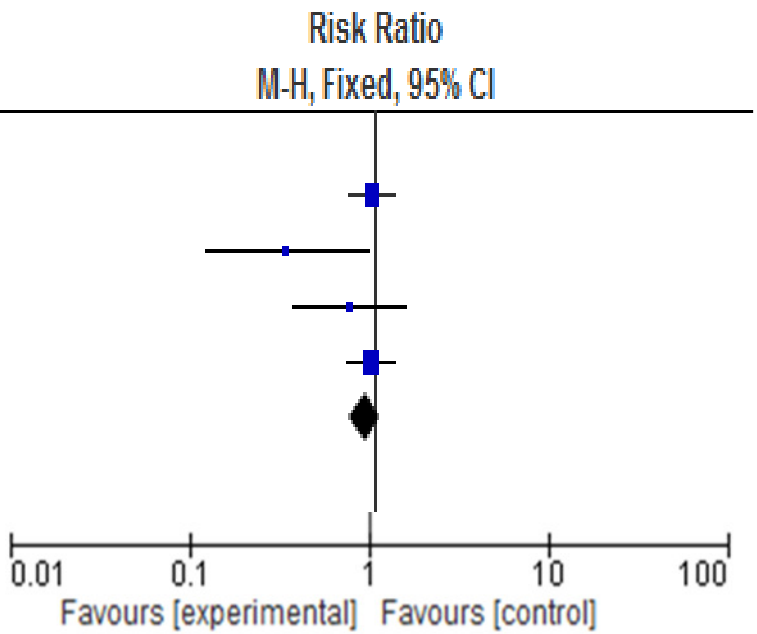
Hospital mortality- RCTs

Study or Subgroup	Experimental Events	Experimental Total	Control Events	Control Total	Weight	Risk Ratio M-H, Fixed, 95% CI
1.9.1 RCTs						
Mehta et al, 2012	63	214	63	209	28.9%	0.98 [0.73, 1.31]
Moon et al, 2015	4	60	13	63	5.7%	0.32 [0.11, 0.94]
Schweickert et al, 2009	9	49	14	55	6.0%	0.72 [0.34, 1.52]
Simons et al, 2016	64	354	68	360	30.5%	0.96 [0.70, 1.30]
Subtotal (95% CI)		**677**		**687**	**71.1%**	**0.89 [0.73, 1.09]**
Total events	140		158			



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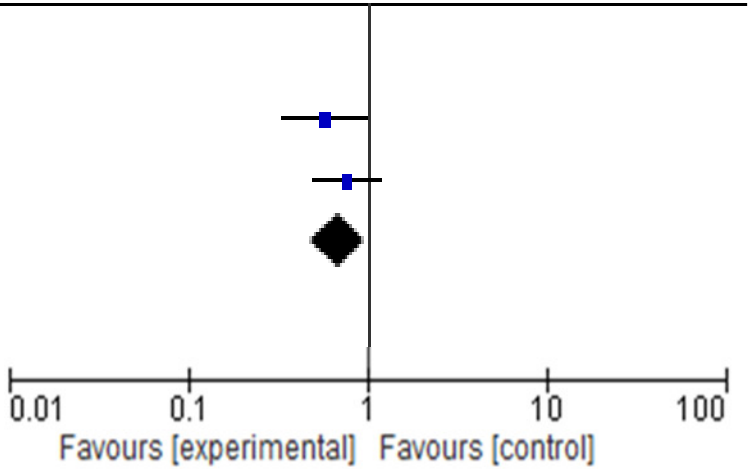
Hospital mortality- NRCTs

Study or Subgroup	Experimental Events	Experimental Total	Control Events	Control Total	Weight	Risk Ratio M-H, Fixed, 95% CI
1.9.2 NRCTs						
Balas et al, 2014	17	150	29	146	13.3%	0.57 [0.33, 0.99]
Kamdar et al, 2013	34	175	28	110	15.6%	0.76 [0.49, 1.18]
Subtotal (95% CI)		325		256	28.9%	0.67 [0.48, 0.95]
Total events	51		57			



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Adverse events

- 7 studies, 4 RCTs & 3 NRCTs
- Self- extubation increased (Girard, Lancet, 2008;)
- 4 minor events (Needham, Arch Phys Med Rehab, 2010;
- 1 minor adverse event (Parry, J Crit Care)

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Sleep quality

- Limited evidence
- 3 studies
- 3 measurements
  - Questionaires- RCSQ, Sleep in the ICU
  - Self report sleep questionaire
  - Night time movement count
- Reported sleep quality improved with non-pharmacological intervention

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Qualitative synthesis

- Positive impact on delirium
- Negative impact on delirium
- Facilitators to implementation
- Barriers to implementation
- Concerns about non-pharmacological treatment

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Positive impact

- Light
- Therapeutic touch
- Family participation in care
- Sleep promotion
- Communication
- Orientation

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Negative impact

- Noise
- Poor orientation
- Restraint use
- Poor organisation of care.

Facilitators

- Changing the culture
- Multidisciplinary champions
- Strong ICU leadership
- Education
- Communication
- Checklists integrated into e-records

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Qualitative synthesis- Facilitators

- Environmental- sleep & light
- Social- family presence, communication
- Individual- familiarity, safety
- Organisational- buy in, champions, education, checklists, strong leadership
- Professional – training & prevention,
- Protocols – control of sedation/analgesia

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Barriers

- Excessive staff turnover
- Lack of resources
- Poor morale
- Lack of knowledge and respect between disciplines

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Qualitative synthesis- Barriers

- Environmental – light, noise, safety concerns
- Individual – lack of memory, distress, fear
- Organisational – workload, wakening patients
- Professional – no therapeutic tools, beliefs
- Protocols – lack of anti-delirium protocols

Concerns

- Safety concerns
- Increased workload
- Lack of education
- Lack of anti-delirium protocols

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Management of medication

- Control pain
- Protocol for drug discontinuation
- Pharmacy review
- Daily interruption of sedation
- Spontaneous awakening trials (SATs)
- Spontaneous Breathing trials (SBTs)

Organisational

- Nursing education
- Patient and relative education
- Family participation
- Group care activities- guidance

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Environmental

- Polysensorial stimulation
- Cognitive stimulation
- Orientation
- Visual display/ calenders
- Sleep promotion
- BLT as part of a multi-component intervention

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Mobilisation

- Early PT & OT
- Motor stimulation of superior limbs
- Training on basic life activities
- Positioning

Conclusion

- Multi-component effective in contrast to single components
- Effectiveness of the single components within these bundles is uncertain.

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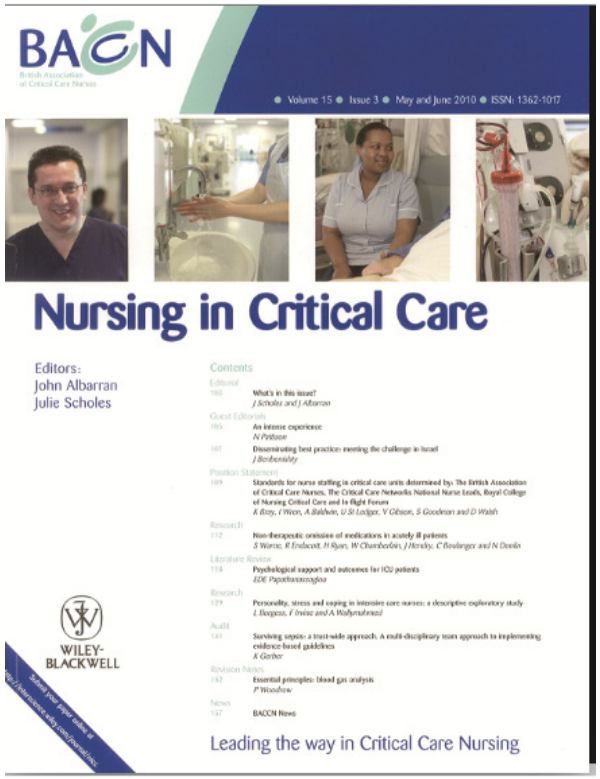
Acknowledgements

Supervisors:
Dr Bronagh Blackwood
Professor Daniel F McAuley
Professor Mike Clarke

Acknowledgements



BACCN British Association of Critical Care Nurses

29 June ·

Research Study on non-pharmacological interventions for delirium
#BACCNNews
https://baccn.org/index.php?cID=385

BACCN - British Association of Critical Care Nurses :: Research Study on non-pharmacological...

Leona Bannon (PhD student from Queen's University Belfast, Northern Ireland) is undertaking a research study on non-pharmacological interventions for delirium in critically ill patients. Delirium is common in intensive care units (ICU) occurring in up to 87% of mechanically ventilated patients and i...

BACCN.ORG

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Questions?

Risk factors

- Drugs
  - Deep sedation
  - Benzodiazepines
- Immobility
- Physical restraints
- Absence of daylight
- Isolation and absence of visits

Pandharipande, Anesthesiology, 2006; 104 (1); 21-6
Van Rompaey, Crit Care, 2009; 13 (3): R77

Multicomponent

RCTs	
Finotto (14)	Orientation, family participation, delirium education & reduce noise
Alvarez (6)	Cognitive stimulation, participation of relatives, physical rehabilitation & training on everyday life activities
Moon (13)	Orientation, communication, sleep management & target risk factors such as immobility, hypoxia, pain, infection, deliriogenic drugs, inadequate nutrition & fluid & electrolyte imbalances
Schweickert (2)	Sedation reduction & early physical and occupational therapy
NRCTs	
Balas (5)	SATs, SBTs, delirium management & early mobility
Bryczkowski (3)	Drug management, non-pharm management & patient and family education
Rivosecchi (9)	Orientation, cognitive stimulation, education, and sleep promotion
Patel (9)	Sleep promotion, pain protocol, early mobility, sedation management & SBT
Needham (7)	Early mobility & protocol & sedation protocol,

Pain and sedation management

RCTs	
Mehta (2)	Protocolised sedation & daily sedation interruption
Girard (2)	Paired SBT & SAT
NRCTs	
Khan (2)	Paired SAT & SBT
Dale (1)	Sedation protocol
Hager (1)	Sedation protocol
Shrobik (1)	Sedation protocol

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Physical rehabilitation

NRCTs	
Parry (1)	Neuromuscular stimulation

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Environmental

RCTs	
Van Rompaey (1)	Earplugs versus no earplugs
Taguchi (1)	Bright light therapy versus control
Simons (1)	Dynamic light application versus control
Ono (1)	Bright light therapy versus control
NRCTs	
Kamdar (10)	Multi-component sleep interventions
Lee (2)	Sleep interventions- eye masks and relaxing music
Black (2)	Education and orientation
Colombo (2)	Cognitive stimulation and orientation

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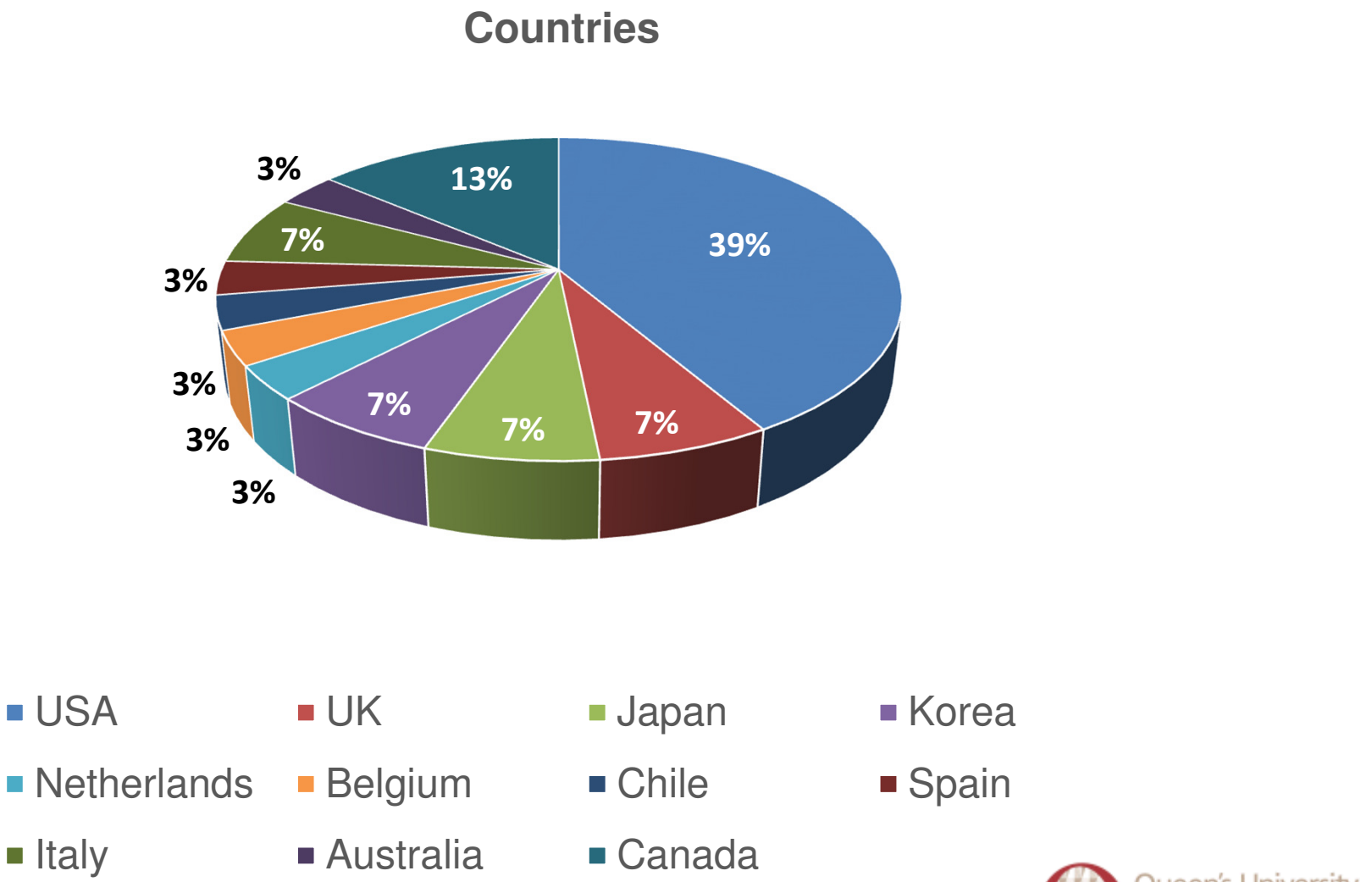
Characteristics of studies



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