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REVIEW

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# Effect of earplugs and eye masks on the sleep quality of intensive care unit patients: A systematic review and meta-analysis

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【Journal Club】

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- ICU臨床情境
- 提出問題(Ask)
- 搜尋證據(Acquire)
- 嚴格評讀(Appraisal)





# ICU臨床情境

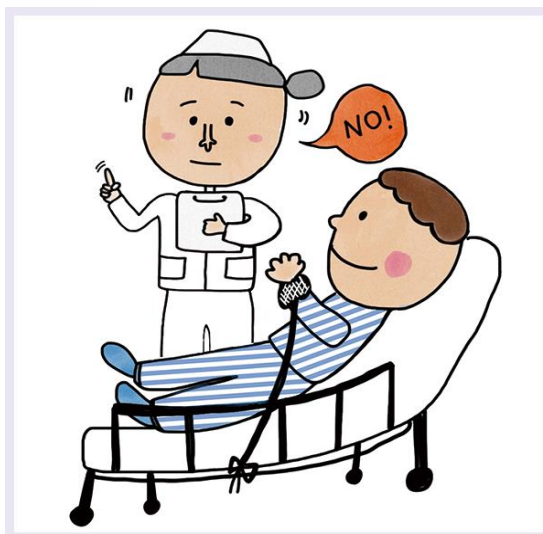


# ICU臨床情境



小姐! 我睡不著，這裡好吵!!

這裡好亮! 我不好睡!



# 提出問題(ASK)



# 提出問題(Ask)



提出問題  
(Ask)

搜尋證據  
(Acquire)

嚴格評讀  
(Appraisal)

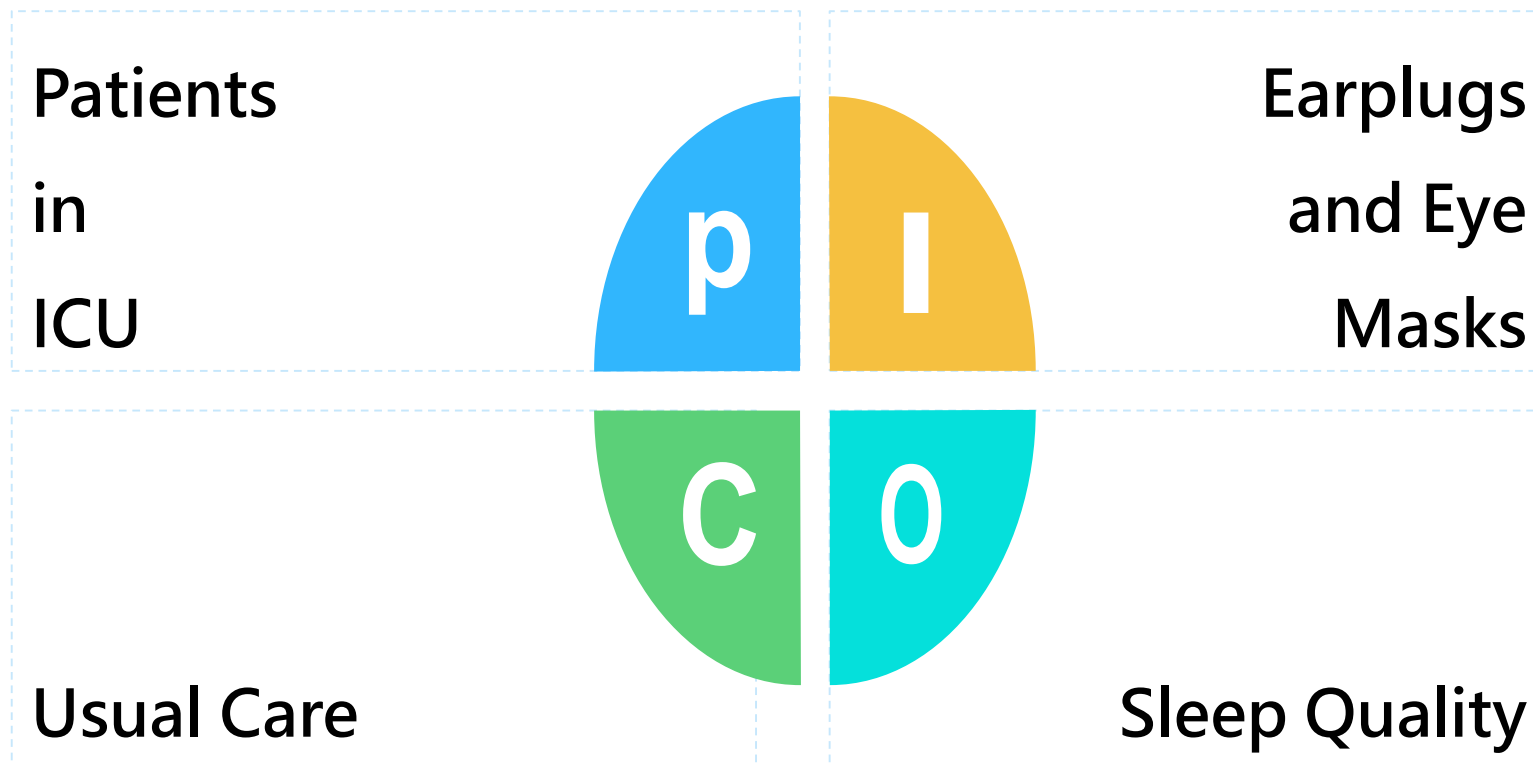
恰當運用  
(Apply)

衡量結果  
(Audit)





# 提出問題(Ask)



提出問題  
(Ask)

搜尋證據  
(Acquire)

嚴格評讀  
(Appraisal)

恰當運用  
(Apply)

衡量結果  
(Audit)



# 搜尋證據(ACQUIRE)





# 搜尋證據(Acquire)

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REVIEW

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## Effect of earplugs and eye masks on the sleep quality of intensive care unit patients: A systematic review and meta-analysis

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Shih-Lun Chang<sup>3,4</sup> | Ching-Ju Fang<sup>5</sup>

提出問題  
(Ask)

搜尋證據  
(Acquire)

嚴格評讀  
(Appraisal)

恰當運用  
(Apply)

衡量結果  
(Audit)



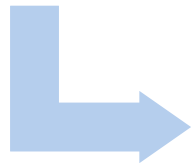
# 嚴格評讀(APPRAISAL)



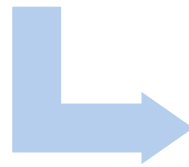
# 嚴格評讀(Appraisal)

FAITH快速評讀

系統性文獻回顧(systematic review)



F-Find、A-Appraisal、I-  
Included、T-Total up、H-  
Heterogeneity



研究結論



# 嚴格評讀(Appraisal)

## ➤ F - 研究是否找到 (Find) 所有的相關證據？

- 良好的文獻搜尋至少應包括**二個主要資料庫**並加上文獻引用索引
- 進行文獻搜尋應使用**MeSH字串及一般檢索詞彙(text words)**
- 盡可能使用**布林邏輯(OR)**組合各種搜尋詞及同義字

2.3 | Search methods—**JAN**—WILEY—4323  
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The Embase, MEDLINE Complete (EBSCOhost), Cochrane Library, CINAHL Plus with Full Text (EBSCOhost), and Index to Taiwan Periodical Literature System databases were searched for studies published from the establishment of each database to May 5, 2020. Results were subsequently saved in the Endnote X9 citation manager. The controlled vocabulary (MeSH) and text words combined four main concepts (earplugs, eye masks, ICU and sleep) of keywords by Boolean operators, AND (critically ill OR critical care OR intensive care OR coronary care unit OR respiratory care unit OR intensive treatment unit OR intensive therapy unit) AND (earplugs OR ear protective device OR noise reduction OR earmuff) OR (eye mask OR eyewear OR eye shield OR light reduction OR eye protective devices) AND (sleep OR night OR sleep disorder OR circadian OR circadian rhythm). All related studies were identified and scanned. The results were saved to Endnote X9 citation manager. Full details of the database search strategy deployed in this study are listed in Appendix S1.

May 5.  
2020

提出問題  
(Ask)

搜尋證據  
(Acquire)

嚴格評讀  
(Appraisal)

恰當運用  
(Apply)

衡量結果  
(Audit)



# 嚴格評讀(Appraisal)

## ➤ F - 研究是否找到 (Find) 所有的相關證據？

### ● 納入條件：

- 1) 研究設計為隨機對照試驗 (RCTs)
- 2) 在介入措施中單獨使用眼罩、耳塞或合併使用
- 3) 受試者皆為大於18歲之重症病人
- 4) 可自行記錄睡眠品質
- 5) 同時搜尋英文及中文文獻

### 2.3 | Search methods

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The inclusion criteria of this study were as follows: (a) The studies utilized randomized controlled trials (RCTs) including 2-arm cross-over trials; (b) Earplugs and/or eye masks were the intervention; (c) Study subjects were over 18 years old and admitted to an intensive care unit; (d) Self-reported sleep quality was the primary outcome; (e) Both English and Chinese studies were language peer-reviewed. The exclusion criteria were as follows: (a) animal or laboratory research, (b) duplicate studies derived from the same research data and (c) literature reviews or

提出問題  
(Ask)搜尋證據  
(Acquire)嚴格評讀  
(Appraisal)恰當運用  
(Apply)衡量結果  
(Audit)

# 嚴格評讀(Appraisal)

## ➤ F - 研究是否找到 (Find) 所有的相關證據？

### ● 排除條件：

- 1) 動物或者是實驗室研究
- 2) 來自相同數據的重複研究
- 3) 類型為文獻探討或案例分析

### 2.3 | Search methods

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The inclusion criteria of this study were as follows: (a) The studies utilized randomized controlled trials (RCTs) including 2-arm cross-over trials; (b) Earplugs and/or eye masks were the intervention; (c) Study subjects were over 18 years old and admitted to an intensive care unit; (d) Self-reported sleep quality was the primary outcome; (e) Both English and Chinese studies were language peer-reviewed. The exclusion criteria were as follows: (a) animal or laboratory research, (b) duplicate studies derived from the same research data and (c) literature reviews or case studies.

提出問題  
(Ask)搜尋證據  
(Acquire)嚴格評讀  
(Appraisal)恰當運用  
(Apply)衡量結果  
(Audit)

# 嚴格評讀(Appraisal)

## ➤ F - 研究是否找到 (Find) 所有的相關證據？

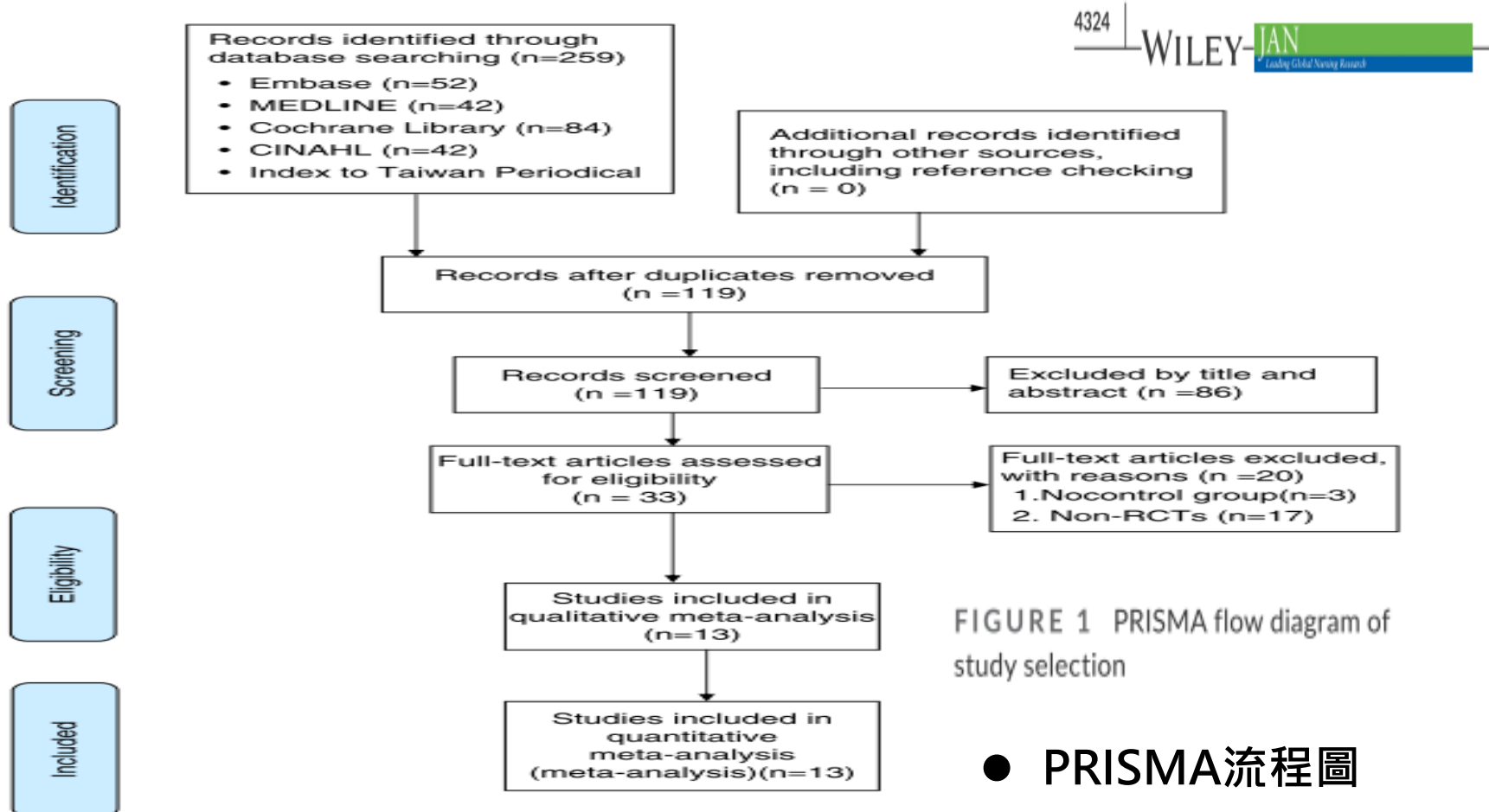


FIGURE 1 PRISMA flow diagram of study selection

## ● PRISMA流程圖



# 嚴格評讀(Appraisal)

## ➤ A - 文獻是否經過嚴格評讀(Appraisal)?

### 2.5 | Quality appraisal

The quality of each article included in the study was assessed independently by two reviewers using Cochrane Collaboration's risk of bias tool for systematic reviews of interventions version (v. 5.2.0). Assessment items included selection bias, performance bias, detection bias, attrition bias and reporting bias. Each assessment item was scored as '+' (representing a low risk of bias), '?' (representing an unclear risk of bias), or '-' (representing a high risk of bias) (Higgins et al., 2017). If the assessment did not reach a consensus on each item, other members of the research team would be invited to resolve the conflict.

### 2.6 | Data abstraction

Two reviewers independently reviewed and extracted the original data of the 13 studies. When they could not reach a consensus, a third reviewer would engage to resolve the disagreement. Characteristics and results of the studies were extracted in terms of the author, year of publication, the nationality of participants, setting, study design, number of participants and details of intervention measures (characteristics, duration, measurement time point, etc.), measurement tools and main findings. A separate table was used to record the raw outcome (e.g. mean and standard deviation [SD]) of each study.



## ● Assessment Tool

The Cochrane Collaboration's risk of bias tool for systematic reviews of interventions version (v. 5.2.0)

兩位reviewer審視搜尋之文獻，若出現意見不一致會由第三位進行判斷，並使用表格呈現研究結果

提出問題  
(Ask)

搜尋證據  
(Acquire)

嚴格評讀  
(Appraisal)

恰當運用  
(Apply)

衡量結果  
(Audit)

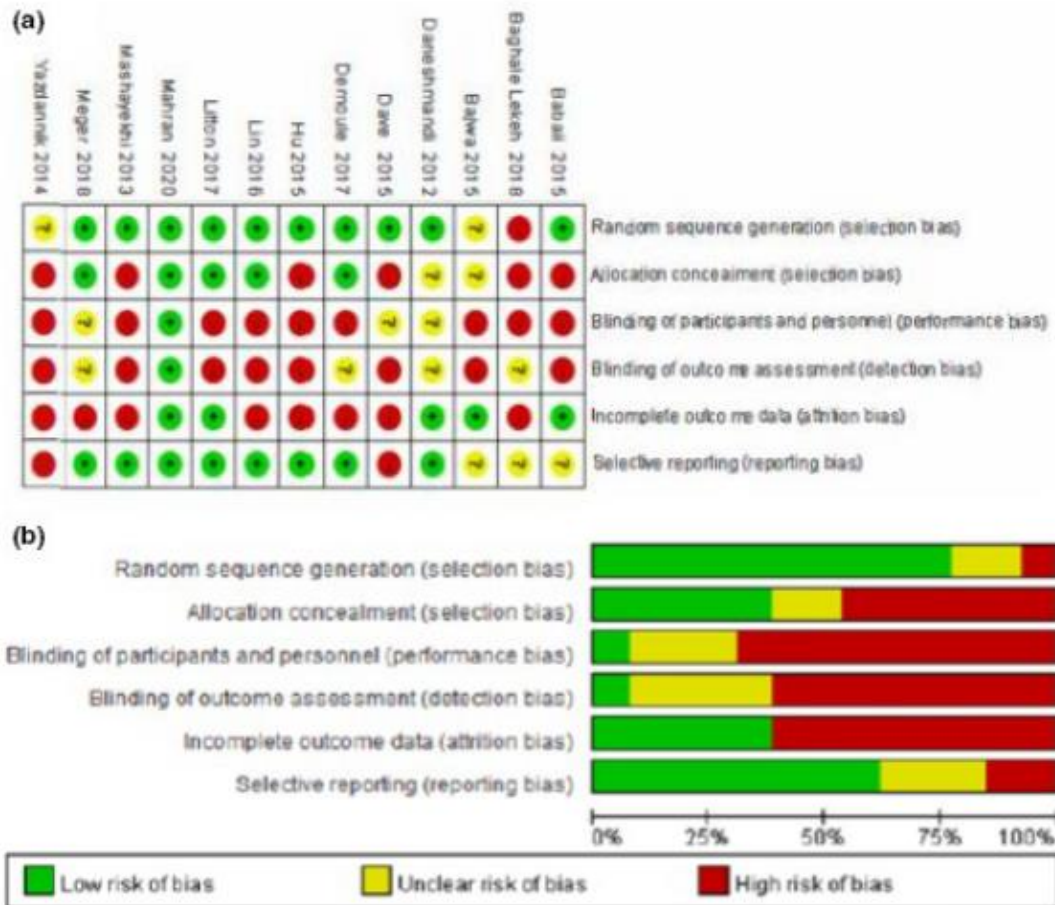


評讀結果

● 是 ○ 否 ○ 不清楚

# 嚴格評讀(Appraisal)

➤ I - 是否只納入(Included)具良好效度的文章?



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- The Cochrane Collaboration's risk of bias tool for systematic reviews of interventions version (v. 5.2.0)

FIGURE 2 Risk of bias assessment: review authors' judgments about each risk of bias item, presented as percentage of include studies. (a) Risk of bias summary. (b) Risk of bias graph



# 嚴格評讀(Appraisal)

TABLE 1 Design characteristics and outcomes of studies

Author/(Year) Country	Setting/Study design	Participants/Intervention characteristics	Duration	Measurement time point	Measurement tools	Main findings
Daneshmandi et al. (2012), Iran	CCU/Two-group controlled clinical trial	E: eye masks (n = 30) C: ATU (n = 30)	1 night (2nd night)	The day after intervention	Pittsburgh Sleep Quality Index	Significant intervention effect was found for sleep quality
Mashayekhi et al. (2013), Iran	CCU/Crossover design	E: eye masks (n = 30) C: ATU (n = 30)	1 night	Not described	Verran and Snyder-Halpern sleep scale	Significant intervention effect was found for sleep quality
Yazdannik (2014), Iran	ICU/Crossover design Clinical trial, (post-test)	Earplugs + eye masks E1: 1st (n = 25), E2: 2nd (n = 25) C: ATU	1 night (10 PM-morning)	The day after intervention (9 AM)	Verran and Snyder-Halpern sleep scale	Significant intervention effect was found for sleep quality
Babaii et al. (2015), Iran	CCU/RCT (non-blind)	E: eye masks (n = 30) C: ATU (n = 30)	3 nights (10 PM-6AM)	The morning after intervention (7 AM)	Pittsburgh Sleep Quality Index	Significant intervention effect was found for sleep quality, sleep fragmentation, sleep latency, sleep length, and sleep supplementation
Bajwa et al. (2015), India	ICU/RCT	E: earplugs+eye masks (n = 50) C: ATU (n = 50)	2 nights (2nd, 3rd night)	On 3rd day	Verran and Snyder-Halpern sleep scale	Significant intervention effect was found for sleep quality
Dave et al. (2015), India	ICU/RCT Crossover design	E: earplugs+eye mask (n = 25) C: ATU (n = 25)	1 night (9 PM-6 AM) (2 <sup>nd</sup> night)	Not described	Richard Campbell Sleep Questionnaire	Highly significant intervention effect was found for sleep quality Noise and light were major sleep disturbing factors

提出問題  
(Ask)

搜尋證據  
(Acquire)

嚴格評讀  
(Appraisal)

恰當運用  
(Apply)

衡量結果  
(Audit)



# 嚴格評讀(Appraisal)

## ➤ I - 是否只納入(Included)具良好效度的文章?

Hu, Jiang, Chen, et al. (2015); Hu, Jiang, Hegadoren, et al. (2015), China	Cardiac Surgical ICU (CSICU)/RCT (post-test)	E: earplugs+eye masks with 30-minute relaxing music (n = 20) C: ATU (n = 25)	2 nights (9 PM-morning)	Not described	Richard Campbell Sleep Questionnaire	Significant intervention effect was found for sleep quality
Lin et al. (2016), China	Cardiac surgery ICU/RCT	E: earplugs+eye masks (n = 32) C: ATU (n = 32)	1 night (9 PM-morning)	The day after intervention	Verran and Snyder-Halpern sleep scale	Significant intervention effect was found for sleep quality
Demoule et al. (2017), France	ICU/RCT	E1: earplugs (n=21), E2: eye masks C: ATU (n = 28)	Every night until ICU discharge (10 PM-8 AM)	ICU discharge	VAS for sleep	No significant intervention effect was found for subjective sleep quality
Litton et al. (2017), Australia	ICU/RCT	E: earplugs (n = 20) C: ATU (n = 20)	1 night (10 PM-6 AM).	Not described	Richard Campbell Sleep Questionnaire	The control group was better than the experimental group in the sleep quality The mean maximum sound level was 69 ±7 dB
Baghaie Lakeh (2018), Iran	CCU/RCT Crossover design	E: earplugs (n = 46) C: ATU (n = 46)	1 night (at least 6 hours)	6 AM to 8 AM	Verran and Snyder-Halpern sleep scale	No significant intervention effect was found for sleep quality
Menger et al. (2018), Austria	Cardiothoracic post anaesthesia care unit/ Randomized study	E: earplugs (n = 27) C: ATU (n = 36)	1 night (10 PM-6 AM)	The morning after intervention	Self-reported quality of sleep (range 1-5)	Significant intervention effect was found for sleep quality
Mahran et al. (2020), Egypt	Cardiac surgery ICU/RCT	E: eye masks (n = 31) C: ATU (n = 35)	3 nights (9 PM-7 AM)	Daily 7 AM	Richard Campbell Sleep Questionnaire	Significant intervention effect was found for sleep quality

Abbreviations: ATU, treatment as usual; CCU, coronary care unit; ICU, intensive care unit; RCT, randomized-controlled trial; VAS, visual analogue scale.

提出問題  
(Ask)

搜尋證據  
(Acquire)

嚴格評讀  
(Appraisal)

恰當運用  
(Apply)

衡量結果  
(Audit)

# 嚴格評讀(Appraisal)

➤ T - 作者是否以表格和圖表  
「總結(Total up)」試驗結果?

➤ H - 試驗的結果是否相近  
(Heterogeneity)?

- 針對結果進行統合分析使用森林圖呈現結果，並加上異質性分析。

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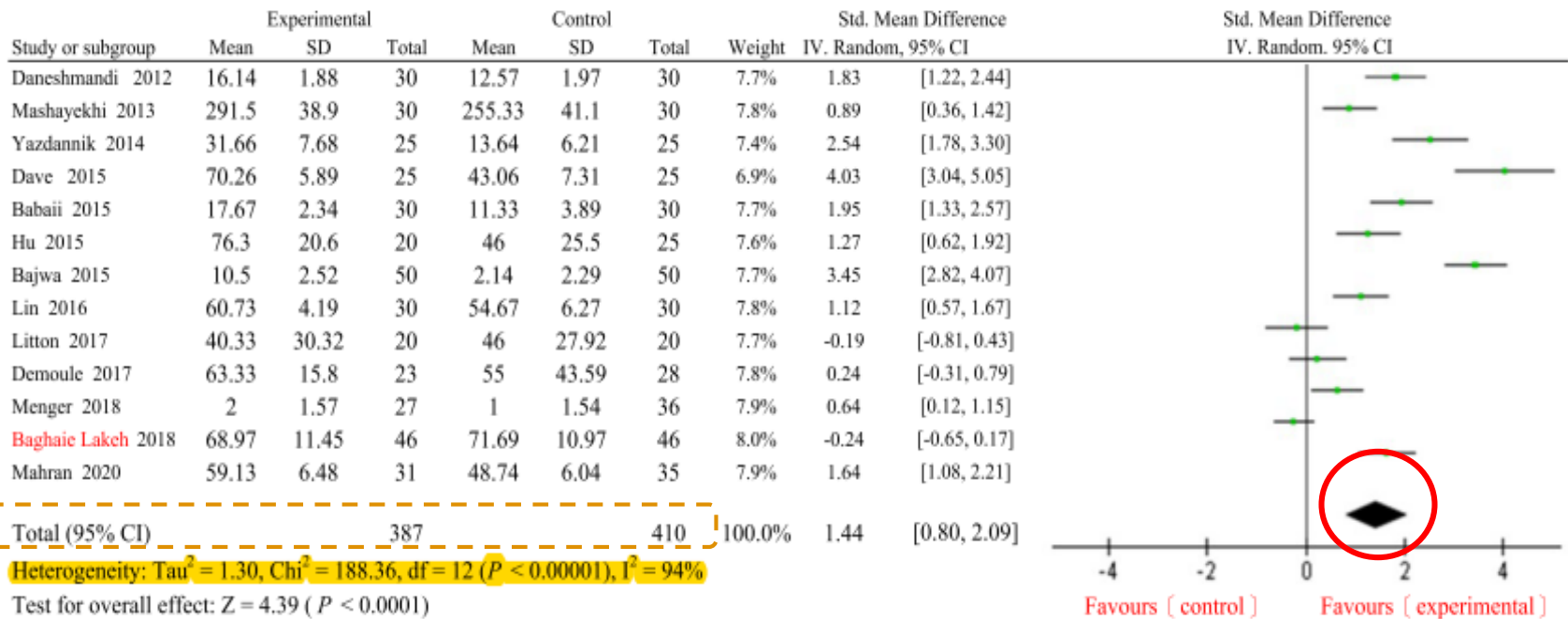


FIGURE 3 Forrest plot standardized mean difference (SMD) of overall sleep quality with earplugs and/or eye masks

Forrest plot



# 嚴格評讀(Appraisal)

- T - 作者是否以表格和圖表「總結(Total up)」試驗結果?
- H - 試驗的結果是否相近 (Heterogeneity)?

- 出現異質性時，可依據受試者的年齡、性別等造成異質性，進行『次群組分析』或『統合性迴歸分析』來解決。

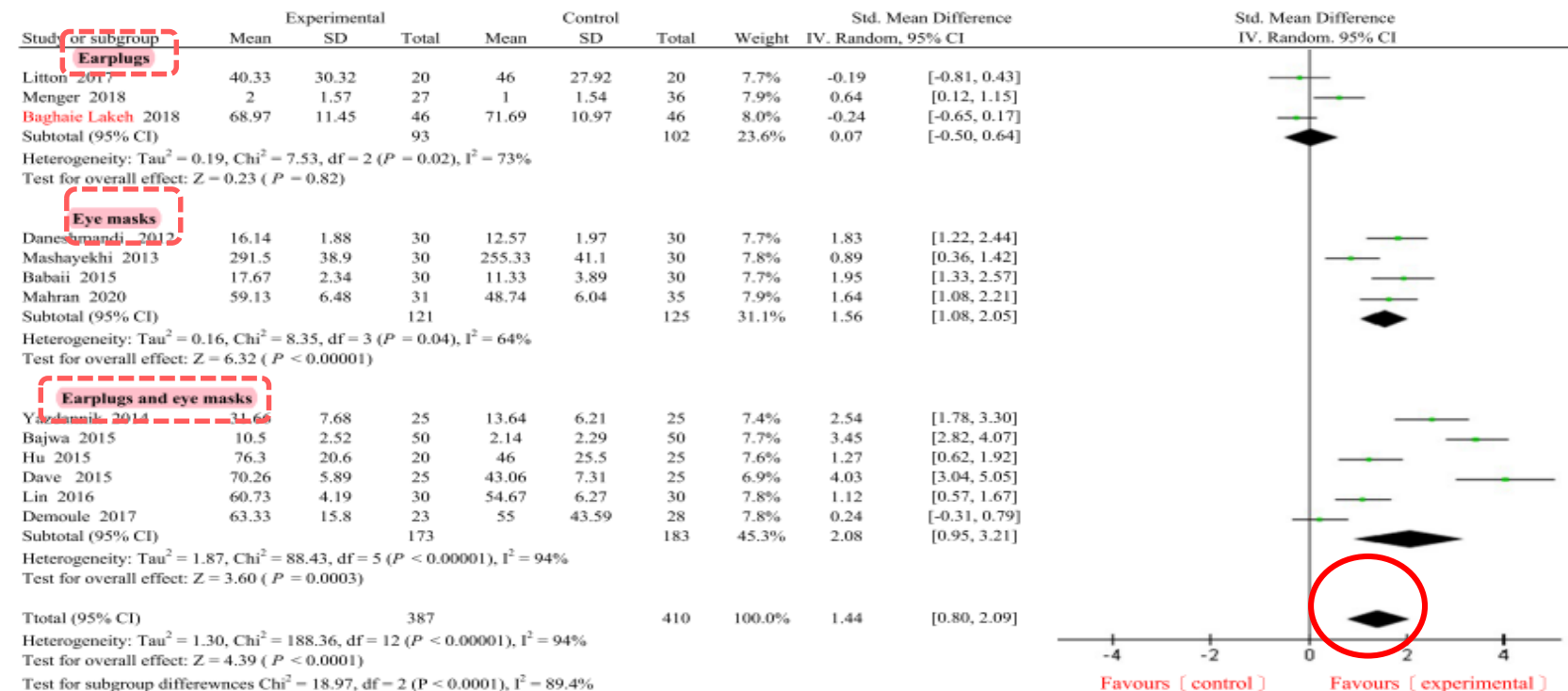


FIGURE 4 Subgroup analysis of intervention characteristics on sleep quality

# 嚴格評讀(Appraisal)

- T - 作者是否以表格和圖表「總結(Total up)」試驗結果?
- H - 試驗的結果是否相近(Heterogeneity)?
- 出現異質性時，可依據受試者的年齡、性別等造成異質性的因素，進行『次群組分析』或『統合性迴歸分析』來解決。

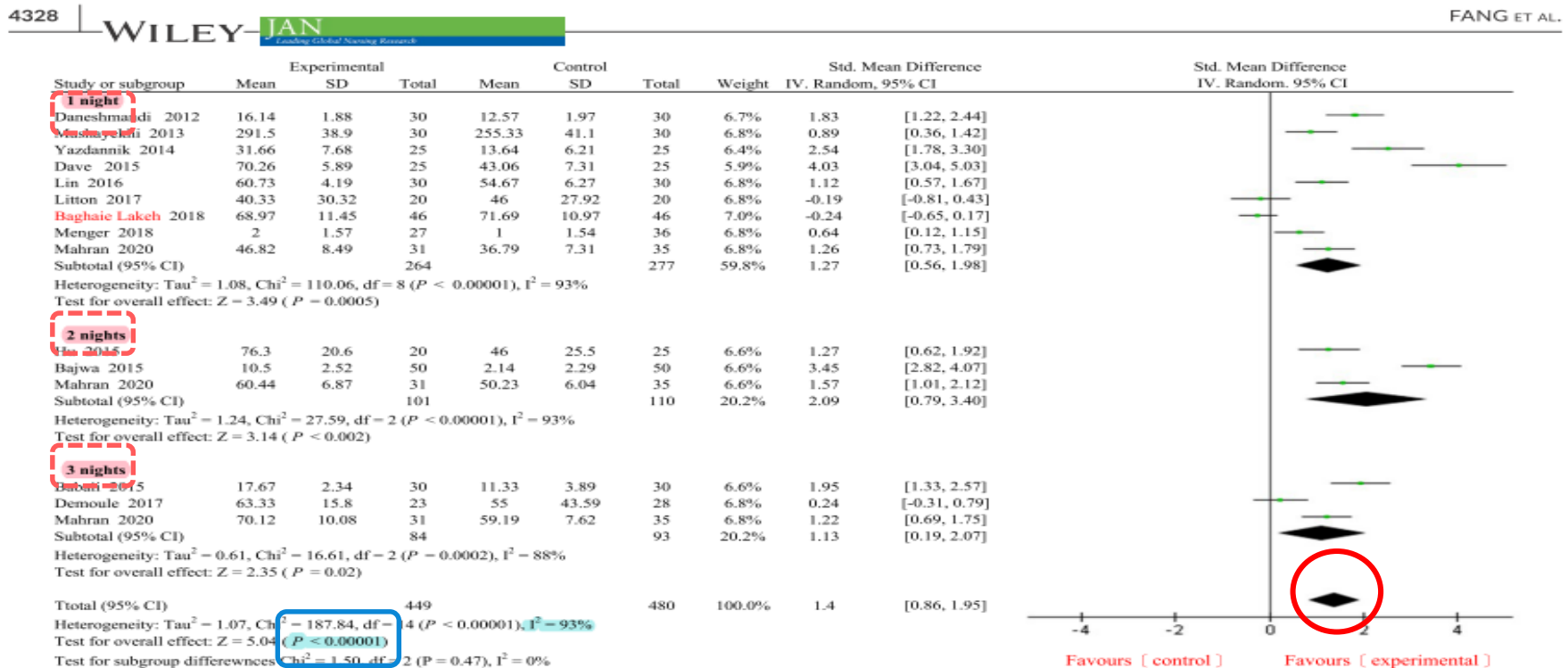


FIGURE 5 Subgroup analysis of intervention duration on sleep quality



# FAITH評估總結

	評估結果		
	是	否	不確定
Find	✓		
Appraisal	✓		
Included	✓		
Total up	✓		
Heterogeneity	✓		



# 統整結論

- 單獨使用眼罩或者是眼罩、耳塞合併使用  
可增加睡眠品質
- 單獨使用耳塞無法增加睡眠品質
- 使用眼罩可增加褪黑激素的分泌
- 連續兩晚合併使用眼罩、耳塞可達到最佳的睡眠品質

提出問題  
(Ask)

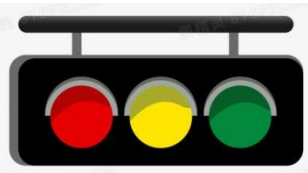
搜尋證據  
(Acquire)

嚴格評讀  
(Appraisal)

恰當運用  
(Apply)

衡量結果  
(Audit)





# 舉牌時間

是否同意重症病人眼罩及耳塞合併使用呢？

同意 20 票

不確定 2 票

不同意 0 票



提出問題  
(Ask)

搜尋證據  
(Acquire)

嚴格評讀  
(Appraisal)

恰當運用  
(Apply)

衡量結果  
(Audit)



