失智症患者接受**科技非藥物處置**

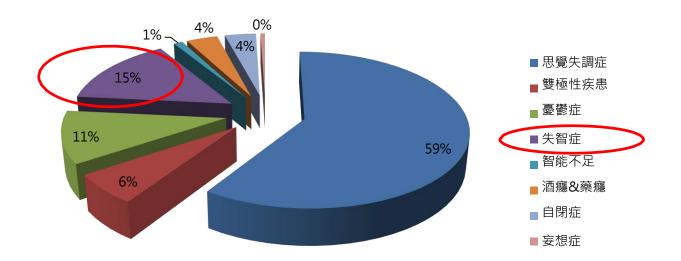# 是否能改善**激躁行為**

精神科病房護理師謝汶玲

背 景
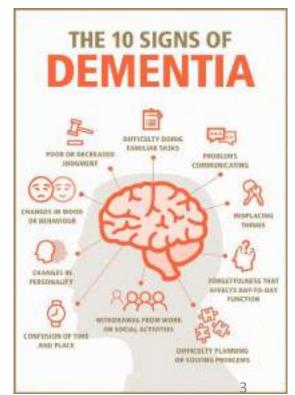
精神科患者診斷：schizophrenia, bipolar, substance use, neurocognitive disorder...

111年度精神科病房之疾病診斷
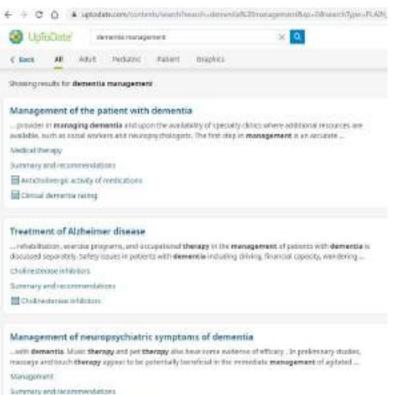

■	思覺失調症
■	雙極性疾患
■	憂鬱症
■	失智症
■	智能不足
■	酒癮&藥癮
■	自閉症
■	妄想症

背 景

- 失智症患者逐年增加
- 記憶、情緒及行為問題，影響生活品質及照顧者負荷
- 近年科技進步 (如：AI智能照護)，許多家屬會詢問，返家後除了藥物之外，還有哪些方法可以使其激躁行為穩定?

THE 10 SIGNS OF DEMENTIA

3

圖片取自https://devon075.wixsite.com/mysite/post/dementia-symptoms-stages-types-treatment

實證步驟

ASK

Acquire

Audit

Apply

Appraise

失智症治療臨床指引

失智症治療臨床指引

- 日落症候群比率多達2/3，常伴隨行為激躁。被偷/被害等妄想比率為30%。

失智症治療

- 藥物
- 非藥物
  - 分散注意力、結構化常規、適當光線、肢體活動、音樂活動、按摩、溝通、芳香療法、寵物療法
  - 科技輔助??

Robotic pet

6

實證議題-PICO

失智症患者接受**科技非藥物處置**是否能改善**激躁行為**

P	I	C	O
失智症患者	科技非藥物處置	無科技非藥物處置	激躁
Dementia OR Neurocognitive disorder	(non-pharmacogical) AND (technology OR mobile)	Treatment as usual	Psychomotor agitation OR agitation OR Restlessness

問題類型

Oxford Centre for Evidence-Based Medicine 2011 Levels of Evidence

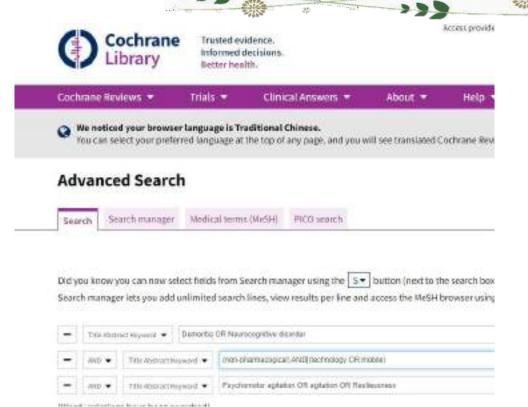| Question	Step 1 (Level 1*)	Step 2 (Level 2*)	Step 3 (Level 3*)	Step 4 (Level 4*)	Step 5 (Level 5)
How common is the problem?	Local and current random sample surveys (or censuses)	Systematic review of surveys that allow matching to local circumstances**	Local non-random sample**	Case-series**	n/a
Is this diagnostic or monitoring test accurate? (Diagnosis)	Systematic review of cross sectional studies with consistently applied reference standard and blinding	Individual cross sectional studies with consistently applied reference standard and blinding	Non-consecutive studies, or studies without consistently applied reference standards**	Case-control studies, or "poor or non-independent reference standard**	Mechanism-based reasoning
What will happen if we do not add a therapy? (Prognosis)	Systematic review of inception cohort studies	Inception cohort studies	Cohort study or control arm of randomized trial*	Case-series or case-control studies, or poor quality prognostic cohort study**	n/a
Does this intervention help? (Treatment Benefits)	Systematic review of randomized trials or n-of-1 trials	Randomized trial or observational study with dramatic effect	Non-randomized controlled cohort/follow-up study**	Case-series, case-control studies, or historically controlled studies**	Mechanism-based reasoning
What are the COMMON harms? (Treatment Harms)	Systematic review of randomized trials, systematic review of nested case-control studies, n-of-1 trial with the patient you are raising the question about, or observational study with dramatic effect	Individual randomized trial or (exceptionally) observational study with dramatic effect	Non-randomized controlled cohort/follow-up study (post-marketing surveillance) provided there are sufficient numbers to rule out a common harm. (For long-term harms the duration of follow-up must be sufficient.)**	Case-series, case-control or historically controlled studies**	Mechanism-based reasoning
What are the RARE harms? (Treatment Harms)	Systematic review of randomized trials or n-of-1 trial	Randomized trial or (exceptionally) observational study with dramatic effect			
Is this (early detection) test worthwhile? (Screening)	Systematic review of randomized trials	Randomized trial	Non-randomized controlled cohort/follow-up study**	Case-series, case-control, or historically controlled studies**	Mechanism-based reasoning

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實證步驟II

資料庫-Cochrane

資料庫-PubMed

資料庫-Embase & 華藝

搜尋流程與證據選擇

研究類型	篇名
meta-analysis	Cho, E., Shin, J., Seok, J. W., Lee, H., Lee, K. H., Jang, J., Heo, S. J., & Kang, B. **(2023).** The effectiveness of non-pharmacological interventions using information and communication technologies for behavioral and psychological symptoms of dementia: A systematic review and meta-analysis. International journal of nursing studies, 138, 104392. https://doi.org/10.1016/j.ijnurstu.202
meta-analysis	Saragih, I. D., Tonapa, S. I., Sun, T. L., Chia-Ju, L., & Lee, B. O. (2021). Effects of robotic care interventions for dementia care: A systematic review and meta-analysis randomised controlled trials. *Journal of clinical nursing*, *30*(21-22), 3139–3152. https://doi.org/10.1111/jocn.15856
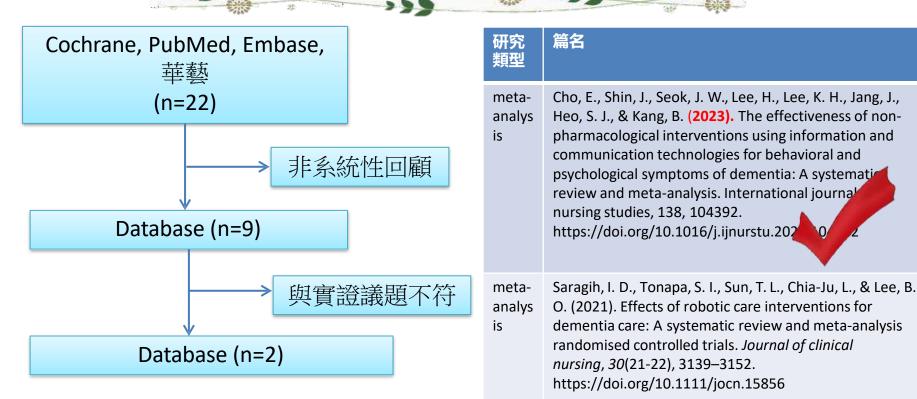
流程圖：

Cochrane, PubMed, Embase, 華藝 (n=22)

→ 非系統性回顧

Database (n=9)

→ 與實證議題不符

Database (n=2)

文章簡介

The effectiveness of non-pharmacological interventions using information and communication technologies for behavioral and psychological symptoms of dementia: A systematic review and meta-analysis

Eunhee Cho, Jinhee Shin, Jo Woon Seok, Hyangkyu Lee, Kyung Hee Lee, Jiyoon Jang, Seok-Jae Heo, Bada Kang

8.7 CiteScore

6.612 Impact Factor

Register · Sign in

Brought to you by: Taipei Medical University

ABSTRACT

Background: Although behavioral and psychological symptoms of dementia are a global public health challenge, non-pharmacological interventions using information and communication technologies can be an affordable, cost-effective, and innovative solution.

Objectives: This study aimed to examine the effectiveness of non-pharmacological interventions using information and communication technologies on the behavioral and psychological symptoms of dementia and identify potential moderators of intervention effects.

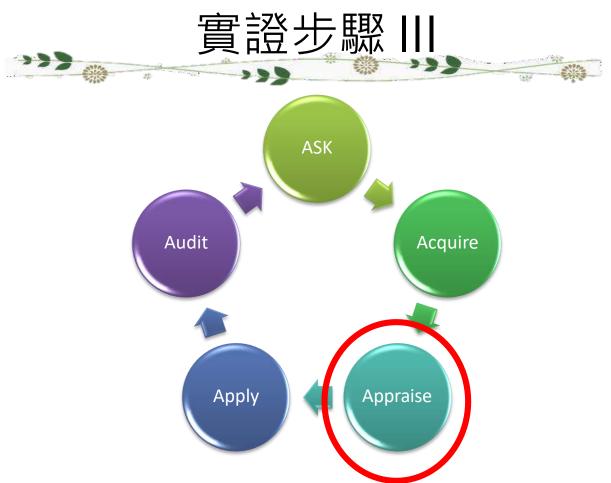*Design:* Systematic review and meta-analysis of randomized controlled trials.

Methods: A systematic literature review was conducted using PubMed, CINAHL, PsycINFO, Embase, and the Cochrane Library from May 2022. Randomized controlled trials that examined the effects of non-pharmacological interventions using information and communication technologies on the behavioral and psychological symptoms of dementia were included. A meta-analysis using a random-effects model was performed to calculate the pooled standardized mean differences between overall symptoms and each type of symptom. For moderator analyses, subgroup and meta-regression analyses were performed.

Results: Sixteen trials (15 articles) met the eligibility criteria. The interventions were grouped into activity engagement interventions using digital health that provided music and reminiscence therapy, physical exercise, social interaction interventions using social robots, and telehealth-based care aid interventions that provided coaching or counseling programs. Pooled evidence demonstrated that non-pharmacological interventions using information and communication technologies exerted a large effect on depression (SMD = −1.088, 95% CI −1.983 to −0.193, $p = 0.017$), a moderate effect on overall behavioral and psychological symptoms of dementia (SMD = −0.664, 95% CI −0.990 to −0.338, $p < 0.001$), and agitation (SMD = −0.586, 95% CI −1.130 to −0.042, $p = 0.035$). No effects on neuropsychiatric symptoms (SMD = −0.251, 95% CI -0.579 to 0.077, $p = 0.133$), anxiety (SMD = −0.541, 95% CI −1.270 to 0.188, $p = 0.146$), and apathy (SMD = −0.830, 95% CI −1.835 to 0.176, $p = 0.106$) were reported. Moderator analyses identified the mean age of the participants as a potential moderator of intervention effects.

Conclusions: Evidence from this systematic review and meta-analysis suggests that non-pharmacological interventions, using information and communication technologies, were an applicable approach to managing behavioral and psychological symptoms among older adults with dementia, with moderate to large effect sizes. However, evidence on anxiety and apathy is inconclusive due to the limited number of existing randomized controlled trials. Future studies with subgroup analyses are warranted to conclude the most effective types of intervention using information and communication technologies for each type of symptom.

Registration: CRD42021258498.

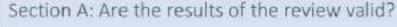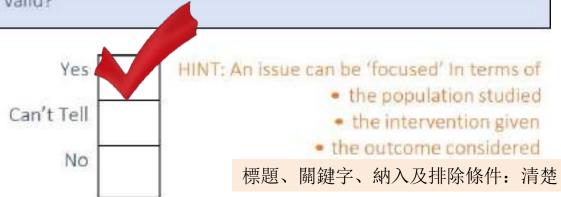# 實證步驟 III

ASK

Acquire

Audit

Apply

Appraise

CASP

Checklists

> **CASP Randomised Controlled Trial Checklist**

- PDF Form
- Print & Fill
- Word

> **CASP Systematic Review Checklist**

- PDF Form
- Print & Fill
- Word

> **CASP Qualitative Studies Checklist**

- PDF Form
- Print & Fill

> **CASP Cohort Study Checklist**

- PDF Form
- Print & Fill

Paper for appraisal and reference:...

Section A: Are the results of the review valid?

1. Did the review address a clearly focused question?

Yes ✓

Can't Tell

No

HINT: An issue can be 'focused' In terms of
- the population studied
- the intervention given
- the outcome considered

標題、關鍵字、納入及排除條件：清楚

The effectiveness of non-pharmacological interventions using information and communication technologies for behavioral and psychological symptoms of dementia: A systematic review and meta-analysis

2.1. Literature search

To identify relevant articles for review, a comprehensive search was conducted with the assistance of an experienced medical librarian using five databases: PubMed, CINAHL, PsycINFO, Embase, and the Cochrane Library. Based on a review of previous relevant articles, the search strategy used a combination of subject headings and keywords for the following concepts: 1) older adults, 2) dementia, 3) behavioral and psychological symptoms of dementia, 4) non-pharmacological intervention, and 5) technology. No restrictions were applied regarding publication status and date to retrieve all the relevant articles. The search was conducted from the inception of the database to May 29, 2022. The entire search strategy tailored for each database is available in the published protocol (Seok et al., 2022) and also updated in Appendix A (Supplementary Tables 1–5), which describes detailed search trails.

2.2. Inclusion and exclusion criteria

As described in the protocol (Seok et al., 2022), the core elements of inclusion criteria in the PICOS format were used as follows: 1) Population: older adults diagnosed with any type of dementia; 2) Intervention: non-pharmacological interventions using information and communication technologies for managing behavioral and psychological symptoms of dementia. A non-pharmacological intervention using information and communication technologies refers to one that employs information and communication technologies such as Internet-based mobile, tablet, video, sensor, and robot as one of the intervention delivery modes, which enhance collecting, processing, saving, and communicating information electronically (Lau et al., 2011); 3) Comparison: studies that assigned participants into either an experimental group or a control group including usual, routine, and conventional care, or waitlist as defined by the original studies; 4) Outcomes: effects of interventions in overall or at least one type of behavioral and psychological symptoms of dementia (e.g., depression, anxiety, agitation, and apathy); and 5) Study Design: randomized controlled trials.

Paper for appraisal and reference:...

2. Did the authors look for the right type of papers?

Yes ✓

Can't Tell

No

HINT: 'The best sort of studies' would
- address the review's question
- have an appropriate study design (usually RCTs for papers evaluating interventions)
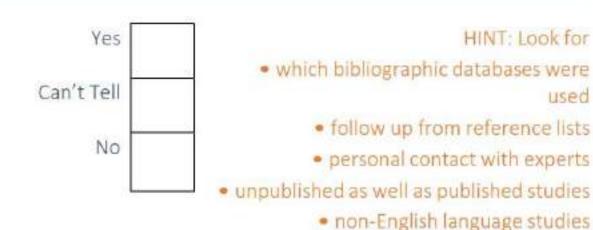
介入性研究，納入嚴謹RCT：合適

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18

3. Do you think all the important, relevant studies were included?

Yes ☐

Can't Tell ☐

No ☐

HINT: Look for
- which bibliographic databases were used
- follow up from reference lists
- personal contact with experts
- unpublished as well as published studies
- non-English language studies

2.1. Literature search

To identify relevant articles for review, a comprehensive search was conducted with the assistance of an experienced medical librarian using five databases: PubMed, CINAHL, PsycINFO, Embase, and the Cochrane Library. Based on a review of previous relevant articles, the search strategy used a combination of subject headings and keywords for the following concepts: 1) older adults, 2) dementia, 3) behavioral and psychological symptoms of dementia, 4) non-pharmacological intervention, and 5) technology. No restrictions were applied regarding publication status and date to retrieve all the relevant articles. The search was conducted from the inception of the database to May 29, 2022. The entire search strategy tailored for each database is available in the published protocol (Seok et al., 2022) and also updated in Appendix A (Supplementary Tables 1–5), which describes detailed search trails. An additional manual search through the bibliographies of the included articles and previously published relevant reviews was also conducted.

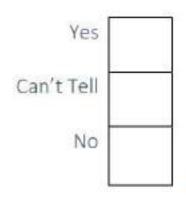### 2.2. Inclusion and exclusion criteria

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Studies were excluded if they 1) were publications in languages other than English; 2) incomplete studies such as study protocols or ongoing studies; 3) included participants with only mild cognitive impairment or cognitive impairment without dementia; 4) did not have sufficient information about the measurement of the outcome of interest; and 5) did not include adequate statistical values (e.g., mean, standard deviation, and median with range) of the quantitative results, which are required to compute an effect size for the meta-analysis procedure.

雖然只有納入英文出版的文章，但可搜尋5個資料庫，納入及排除條件清晰

3. Do you think all the important, relevant studies were included?

Yes

Can't Tell

No

HINT: Look for

- which bibliographic databases were used
- follow up from reference lists
- personal contact with experts
- unpublished as well as published studies
- non-English language studies

流程圖清楚、表一可知：國家、研究機構非單一，雖沒有納入Gray reference，但內文有交代其原因(考量文章品質)

3. Do you think all the important, relevant studies were included?

Yes ✓

Can't Tell

No

HINT: Look for
- which bibliographic databases were used
- follow up from reference lists
- personal contact with experts
- unpublished as well as published studies
- non-English language studies

3.5. Risk of bias

The risk of bias assessment for the 15 studies is summarized in Supplementary Table 6 and demonstrated in Supplementary Fig. 1. The quality of the included studies varied. Four studies were rated as having "low risk." Six studies were judged as having "some concerns," primarily in terms of the randomization process or deviations from intended intervention, or both, or in measurement of the outcome. The remaining studies were rated as having "high risk" due to an inadequate randomization process, deviations from intended interventions, measurement of the outcome, or selection of the reported result. All included studies had a low risk of bias in missing outcome data, and all but one had a low risk of bias in the selection of reported results.

Publication bias was evaluated based on a visual inspection of the funnel plot asymmetry and Egger's test (Egger et al., 1997). Egger's test failed to detect a statistically significant asymmetry in the study distribution ($p = 0.331$). However, the funnel plot in Supplementary Fig. 2 is broadly symmetrical, indicating no publication bias in behavioral and psychological symptoms of dementia.

Q3：雖然沒有手動搜尋灰色文獻，但有搜尋5個資料庫、納入及排除條件、流程圖清晰，且(表一)有整理國家及場域，並驗證 "出版偏差"。

Supplementary Figure 2. Assessment of publication bias

21

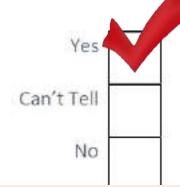4. Did the review's authors do enough to assess quality of the included studies?

written peer-reviewed studies that fulfilled the following inclusion criteria: 1) two independent reviewers (JS and JWS) screened the titles and abstracts of the identified articles according to the inclusion and exclusion criteria, and 2) after retrieving and uploading the full text of the potentially relevant articles to the Endnote software, the two reviewers conducted a full-text-level assessment to select the eligible articles to be included in this systematic review and meta-analysis. At each step, any disagreements and discrepancies were discussed with a third reviewer (BK) until a consensus was reached.
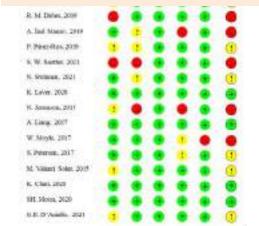
2.4. Risk of bias assessment

At least two reviewers independently assessed the risk of bias and quality of the included studies using the revised Cochrane risk-of-bias tool for randomized trials (RoB 2) (Sterne et al., 2019). The tool assesses five bias domains that could occur in randomized controlled trials: randomization process, deviations from intended interventions, missing outcome data, measurement of the outcome, and selection of reported results. Each domain consists of a set of questions with response options ("low," "some concerns," and "high") for categorizing risk-of-bias judgments. Studies were categorized as "low," "some concerns," or "high" the overall risk of bias score. The overall risk of bias was considered "low risk of bias" if all five domains were judged as low risk, "Some concern bias" if at least one domain was judged as having some concern of high with no domains judged as high risk, and "high risk of bias" when at least one domain was judged as high risk (Sterne et al., 2019). Any discrepancies were resolved in the discussion with a third reviewer when necessary, and a consensus was reached.

Yes ✓
Can't Tell
No

HINT: The authors need to consider the rigour of the studies they have identified. Lack of rigour may affect the studies' results ("All that glisters is not gold" Merchant of Venice – Act II Scene 7)

由二位評讀人員使用RoB2.0工具獨立評讀文章品質，意見紛歧時，則由第三位評讀者判定。雖然高風險偏誤有5篇，但整體為低到中度風險。也有在內文呈現高風險的原因。

3.5. Risk of bias

The risk of bias assessment for the 15 studies is summarized in Supplementary Table 6 and demonstrated in Supplementary Fig. 1. The quality of the included studies varied. Four studies were rated as having "low risk." Six studies were judged as having "some concerns," primarily in terms of the randomization process or deviations from intended intervention, or both, or in measurement of the outcome. The remaining studies were rated as having "high risk" due to an inadequate randomization process, deviations from intended interventions, measurement of the outcome, or selection of the reported result. All included studies had a low risk of bias in missing outcome data, and all but one had a low risk of bias in the selection of reported results.

22

5. If the results of the review have been combined, was it reasonable to do so?

Yes ☐

Can't Tell ☐

No ☐

HINT: Consider whether

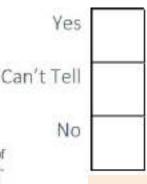- results were similar from study to study
  - results of all the included studies are clearly displayed
  - results of different studies are similar
- reasons for any variations in results are

2.5. Data synthesis and analysis

A narrative synthesis was conducted to describe the characteristics of the included studies. Statistical analyses for the meta-analysis were performed using R version 4.0.3 (R Foundation for Statistical Computing, Vienna, Austria). As the studies used different measures for the outcomes of interest, the standardized mean difference was calculated (SMD) to determine the effects of the intervention in the experimental group compared to the control group. SMDs were computed by calculating Hedges' g

$I^2 > 50\%$，由森林圖可知，其結果大多偏於線的左邊。

This study had several limitations. First, the major limitation of this review is the moderate to large heterogeneity between studies. Although the underlying sources of the variation were explored and detected by conducting moderator analyses, results must be interpreted with caution because uncontrolled or unmeasured factors, which were not included in the moderator analyses due to unavailable information, potentially produce bias. Second, although blinding interventionists is challenging in care settings for the dementia population, there were risks of bias caused by the absence of blinding for study participants and interventionists in most of the included studies. Third, the results regarding the effectiveness of non-pharmacological interventions using information and communication technologies on anxiety and apathy are inconclusive because of the small number of studies. Thus, interpretations regarding the results from the subgroup analyses for anxiety and apathy should be made with caution. Furthermore, although this study was unable to conduct multivariate meta-regression due to the insufficient number of studies concerning the non-significant results of the subgroup analyses for potential moderators, future moderator analyses using multivariate meta-regression with a

23

5. If the results of the review have been combined, was it reasonable to do so?

Yes ☑

Can't Tell

No

HINT: Consider whether
- results were similar from study to study
- results of all the included studies are discussed

雖然 I^2 >50%，但在討論時有分析可能的原因（無法控制的干擾因素、多篇之介入者未盲化、篇數較少）。由森林圖可知，其結果大多偏於線的左邊。但Population及Intervention範圍較大

interventions (D'Aniello et al., 2021; Pérez-Ros et al., 2019). Reminiscence interventions have been implemented using the smartphone application (Moon and Park, 2020) and internet-based video (İnel Manav and Simsek, 2019; Moon and Park, 2020). A few studies provided activity programs using personalized multimedia devices (Davison et al., 2016; Sautter et al., 2021). Training games with motion-based input devices have been used to motivate participants' engagement in physical exercise activities (Swinnen et al., 2021). For care-aid programs, a telephone support program, an internet-based e-learning course, and a real-time consultation program using an online meeting program have been implemented to aid informal caregivers of older adults with dementia (Dröes et al., 2019; Laver et al., 2020). For social interaction interventions, most studies have used a companion pet robot to encourage social interaction through behaviors such as petting, talking, and smiling (Jøranson et al., 2015; Liang et al., 2017; Moyle et al., 2017; Petersen et al., 2017; Valenti Soler et al., 2015). Humanoid robots have been utilized to increase social interactions via talking and singing (Chen et al., 2020; Valenti Soler et al., 2015).

- **網絡音樂播放器(音樂治療)**
- **APP視頻（懷舊治療)。**
- **促進運動之個性化多媒體設備**
- **護理遠距衛教/支持，**
- **寵物機器人(通過撫摸、交談和微笑等行為來鼓勵社交互動)**
- **AI機器人**

24

6. What are the overall results of the review?

HINT: Consider

- If you are clear about the review's 'bottom line' results
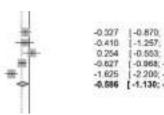- what these are (numerically if appropriate)
- how were the results expressed (NNT, odds ratio etc.)

整體結果：非藥物科技處置可降低失智症患者的激躁行為，效果量為 0.586，屬中等效應

4.4. Conclusions

The present review has shown that non-pharmacological interventions using information and communication technologies were a functional approach to managing behavioral and psychological symptoms among older adults with dementia, with several trials reporting moderate to large effect sizes. Pooled evidence has demonstrated that non-pharmacological interventions using information and communication technologies exert a significant effect on depression and a moderate effect on agitation and overall behavioral and psychological symptoms of dementia. However, given that insufficient evidence is currently available to assess whether this intervention approach can effectively manage anxiety and apathy, results on anxiety and apathy remain inconclusive. Effect sizes varied between target symptoms, and the moderator analyses suggested that this intervention approach was more effective in younger participants than older participants. Thus, cli-

Agitation								
Jararson, 2015	27	-2.20	9.14	26	1.50	12.90	-0.327	[-0.870, 0.215]	0.237
Davison, 2016	11	-8.50	16.80	11	-2.70	9.35	-0.410	[-1.257, 0.438]	0.342
Liang, 2017	13	-0.70	9.33	11	-3.00	8.01	0.254	[-0.553, 1.060]	0.538
Moyle, 2017	67	-2.66	6.15	72	1.22	6.15	-0.627	[-0.968, -0.286]	<0.001
Laver, 2020	31	-3.20	1.46	32	-0.80	1.46	-1.625	[-2.200, -1.051]	<0.001
Random Effect Model	149			152			-0.586	[-1.130, -0.042]	

Heterogeneity: $I^2 = 77\%$, $\tau^2 = 0.264$, $p < 0.001$
Test for effect in subgroup: $z = -2.11$ ($p = 0.035$)

25

7. How precise are the results?

HINT: Look at the confidence intervals, if given

agitation, five trials involving 301 participants were pooled. The pooled effects of interventions on the reduction of the level of agitation were statistically significant, with a moderate effect size (SMD $= -0.586$, 95% CI -1.130 to -0.042, $p = 0.035$). Moderate but significant heterogeneity was observed among the studies ($I^2 = 77\%$, $p = 0.001$). For anxiety, only two trials tested the effects of the interventions on anxiety levels. The pooled effects of the interventions on the reduction of anxiety were not statistically significant (SMD $= -0.541$, 95% CI -1.270 to

Agitation

Jøranson, 2015	27	-2.20	9.14	26	1.50	12.90		-0.327	[-0.870; 0.215]	0.237
Davison, 2016	11	-8.50	16.80	11	-2.70	9.35		-0.410	[-1.257; 0.436]	0.342
Liang, 2017	13	-0.70	9.33	11	-3.00	8.01		0.254	[-0.553; 1.060]	0.538
Moyle, 2017	67	-2.66	6.15	72	1.22	6.15		-0.627	[-0.968; -0.286]	< 0.001
Laver, 2020	31	-3.20	1.46	32	-0.80	1.46		-1.625	[-2.200; -1.051]	< 0.001
Random Effect Model	**149**			**152**				**-0.586**	**[-1.130; -0.042]**	

Heterogeneity: $I^2 = 77\%$, $\tau^2 = 0.284$, $p = 0.001$
Test for effect in subgroup: $z = -2.11$ ($p = 0.035$)

8. Can the results be applied to the local population?

Yes ☐

Can't Tell ☐

No ☐

HINT: Consider whether

- the patients covered by the review could be sufficiently different to your population to cause concern
- your local setting is likely to differ much from that of the review
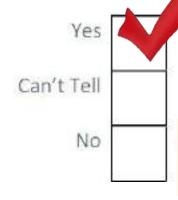
inclusion criteria in the PICOS format were used as follows: 1) **Population:** older adults diagnosed with any type of dementia; 2) **Interven-**

Studies were excluded if they 1) were publications in languages other than English; 2) incomplete studies such as study protocols or ongoing studies; 3) included participants with only mild cognitive impairment or cognitive impairment without dementia; 4) did not have sufficient in-

3.2. Characteristics of the included studies

Table 1 presents the characteristics of the included studies. With the publication years ranging from 2015 to 2021, over 37.5% of the included studies were published after 2020. The studies were conducted in Europe (n = 8), Oceania (n = 4), the United States (n = 2), and Asia (n = 2). The trials were implemented in both residential long-term care settings (n = 12) and community settings, including daycare centers (n = 1), meeting centers (n = 1), homes (n = 1), and both daycare centers and homes (n = 1). The mean age of study participants ranged from 74.1 years (Inel Manav and Simsek, 2019) to 90.0 years (Sautter et al., 2021). The percentage of female participants ranged from 39.7% (Laver et al., 2020) to 100% (Moon and Park, 2020).

Table 3
Moderator analyses for the intervention effects on the overall behavioral and psychological symptoms of dementia.

Continuous moderators	k	Slope	SE	Tau²	Q	P-value
Age	27	0.139	0.058	0.048	4.870	0.026
Women (%)	24	0.026	0.014	0.065	3.425	0.064
Sample size	27	−0.018	0.006	0.005	2.378	0.108

Categorical moderators	k	Effect size (Hedges' g)	95% CI	Q_between	p-value
Country				1.380	0.240
Europe	12	−0.501	−1.357, −0.264		
Non-Europe	15	−0.495	−0.787, −0.223		
Setting				2.080	0.151
Community-dwelling	7	−0.300	−0.833, 0.216		
Residential care setting	20	−0.591	−1.186, −0.093		
Intervention				5.000	0.082
Social interaction	14	−0.284	−0.521, −0.048		
Care-aid	2	−0.874	−2.327, 0.579		
Music, reminiscence, exercise activity	11	−1.174	−1.598, −0.399		
Group				0.450	0.500
Group	6	−0.364	−1.672, −0.038		
Individualized	18	−0.570	−0.836, −0.303		
Duration				1.720	0.424
≤4 weeks	5	−0.380	−0.807, −0.042		
4–8 weeks	9	−0.987	−1.771, −0.042		
>8 weeks	13	−0.568	−0.527, −0.247		
Risk of bias				2.030	0.363
High	6	−0.640	−1.181, −0.118		
Some concerns	13	−0.888	−1.602, −0.173		
Low	8	−0.524	−0.757, −0.108		

Section C: Will the results help locally?

8. Can the results be applied to the local population?

Yes ✓

Can't Tell

No

HINT: Consider whether
- the patients covered by the review could be sufficiently different to your population to cause concern

Q8：未限定特殊失智症族群、國家有歐美及亞洲，地點包含長期機構、社區、日間及居家，且表一可提供詳細的介入科技類型

Section C: Will the results help locally?

9. Were all important outcomes considered?

Yes ☑
Can't Tell ☐
No ☐

HINT: Consider whether
• there is other information you would like to have seen

Q8：探討的結果變項包含憂鬱、激躁、冷漠、焦慮，且有探討干擾因素

Table 2
Characteristics of non-pharmacological interventions using information and communication technologies for behavioral and psychological symptoms of dementia.

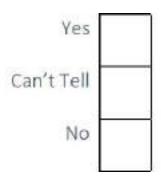| Author (year)	Intervention (individualized or group)	Technology	Control group	Intervention provider	Duration Length [h](frequency)	Outcomes (instrument)
Activity engagement						
D'Aniello et al. (2021)	Music therapy with participants' preferred song selection (individualized)	Web-based music player (MP3)	Usual care	Researcher (Psychologist)	8/38 (2)	Neuropsychiatric symptoms (NPI)
Davison et al. (2016)	Operating multimedia device loaded with participants' preferred materials such as favorite music tracks, movies, video messages, and photos (individualized)	Personalized multimedia device (Memory Box)	Weekly 30-min visits	Researcher	4/2.6 (average) (Daily)	Depression (CSDD), Anxiety (RAID), Agitation (CMAI)

Either overall behavioral and psychological symptoms of dementia or a single type of behavioral and psychological symptoms of dementia were measured as target outcomes in the included trials: neuropsychiatric symptoms (n = 8), depression (n = 9), agitation (n = 5), apathy (n = 3), and anxiety (n = 2). Previous studies have measured the aforementioned outcomes using various symptom-measuring instruments. Most studies used the Neuropsychiatric Inventory (NPI) to measure neuropsychiatric symptoms (Chen et al., 2020; D'Aniello et al., 2021;

3.7. Moderator analysis

Univariate meta-regressions for continuous moderators based on the random-effects model were performed to examine whether the effect sizes on reduction in behavioral and psychological symptoms of dementia were significantly correlated with the mean age of participants, the proportion of women, and sample size. As shown in Table 3, the results revealed that the intervention effect was significantly moderated by age ($\beta = 0.129$, SE $= 0.058$, $p = 0.026$) but not by proportion of women ($p = 0.064$) and sample size ($p = 0.109$). Subgroup analyses were performed to assess pre-selected potential categorical moderators such as country, setting, intervention type, intervention mode (group vs. individualized), intervention duration, and risk of bias. As a result, none of the preselected categorical variables were moderators that caused heterogeneity in effect sizes between trials. For example, activity

10. Are the benefits worth the harms and costs?

Yes ☐

Can't Tell ☐

No ☐

HINT: Consider
- even if this is not addressed by the review, what do **you** think?
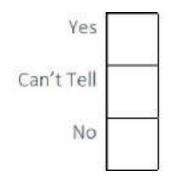
"When her humans arrive home, she goes quickly to welcome them. When they walk around, she follows. When she is pet, she expresses happiness."

But that's not all she does. She sneezes, scratches, and roams the home easily, and even investigates suspicious objects. This robot also beatboxes, dances, and even poses for pictures.

At just $449 USD, she is very affordable, especially considering she can stay with the family forever.

Loona uses vision, listening, and haptic perception to engage with the world around her making her very responsive to her environment.

約台幣13,700元

10. Are the benefits worth the harms and costs?

Yes ☐

Can't Tell ☐

No ☐

HINT: Consider
- even if this is not addressed by the review, what do **you** think?

（圖一）

運用 Zenbo 陪伴型機器人於路易氏體失智症併精神行為症狀病人之護理經驗

三、Zenbo 陪伴型機器人於路易氏體失智症病人之運用

精神行為症狀常造成失智症病人增加醫療費用和負擔，寵物治療的介入多年來已證實在情感上是有助益的，隨著超高齡化社會到來及失智創新科技發展，陪伴型機器人已漸漸取代傳統寵物深入高齡者生活扮演不同角色，研究亦顯示其可緩解失智症病人的壓力及焦慮感（Petersen et al., 2017），國內科技公司因應人工智慧的興起，開發了結合雲端自然語言處理技術的陪伴型機器人「Zenbo」（圖一），內建教育、娛樂、健康照護等功能運用於居家照護（徐榮良、白，2018）。

作用，被鮮明的視幻覺、視覺扭曲伴隨肢體障礙之精神行為症狀所苦，Zenbo可運用功能有「語音指令控制」：建立啟動播放指定問候語句，搭配音效與舞蹈效果吸引病人注意，以協助培養真現實感的日常作息；「跟隨」：底盤加裝輪子可移動，當告知「嗨！Zenbo，跟我走。」即啟動感知前方人物並隨行，搭配互動過程透過螢幕呈現不同臉譜與否控互動溝通，讓機器人頭部時展現著含表情，達到給予病人情緒支持及陪伴效果。其「說故事」、「觸控螢幕」功能則可述說病例閱讀文學作品、下載觸控遊戲、搭放音樂及影片之互動結果，讓病人由症狀干擾中達到轉移注意力成效，以內建遊戲互動方式進行感官刺激及肢體復建、可緩解焦慮情緒，降低精神行為症狀發生，同時減輕家屬負擔並彌補照護人力的不足（白等，2018；朱、林，2019）。

4.運用Zenbo陪伴型機器人介入日常生活，如下表：

時間（分鐘）	活動
09:10-09:30(20)	跟早操
09:30-09:50(20)	讀報
14:00-14:30(30)	大眾午安
19:00-19:30(30)	互動時間

(1) 搭配病人作息於每日早、午時段使用建立之機動性：「跟早操」、「讀報」、「大眾午安」，讓Zenbo以貼圖快速、完整、貼圖、不同表情顯示，搭隨音樂節奏的聲光效果吸引病人注意，告知現在時間，引導病早起床做運動，於早操結束後給予讚美並與病人互動；午休後喚醒病人，藉由一致性的生活常規讓其建立定向感。

(2) 每天晚間固定時段會請Zenbo至病人面前，閱讀「翻色卡」，遊戲啟動病人物做觸控互動、訓練視覺分辨，鼓勵協調並達到娛樂效果，當病人讀對回顧色卡時配對巧Zenbo即時予給予「做得好！」之正向回應。

(3) 當病人出現幻覺干擾時，使用Zenbo「播放歌曲」功能，播放其熟悉的台語歌曲如：「想欲的人」、「春夏秋冬」、「走馬燈」，營造熟悉的氛圍，以減緩及轉移精神行為症狀。

10. Are the benefits worth the harms and costs?

Yes ☑

Can't Tell

No

HINT: Consider
- even if this is not addressed by the review, what do **you** think?

討論與結論

　　筆者並非初次照護失智症病人，但面對幻覺及焦慮症狀如此明顯，調整用藥初期時常大哭、激動護周的路易氏體失智症病人，衝擊的感受仍十分強烈，當病人處於幻覺和焦躁言行同時出現的急性發作期時，護理過程更感挫折，故透過查閱文獻，運用Zenbo陪伴型機器人訂定合適的活動安排，加上相關溝通技巧及環境調節，協助病人逐漸達成護理目標，其家屬及外傭也從一開始畏氣、不耐煩的負向表現，在治療後期以自信言誤回饋，陪同病人出院返家，為筆者成就感所在。

　　本次運用Zenbo陪伴型機器人於路易氏體失智症病人照護過程中正向收穫為初期病人即被其圓滑帶質感的外觀、可愛討喜的表情吸引，其語音回饋互動、跟隨、展現吉舞臉語功能皆讓病人感到新奇好玩，進一步能持續接受相關視覺、聽覺、觸覺刺激，達到改善症狀之效果。顯示Zenbo外型被接納度尚，快速提供多樣化訊息能力可順利與病人建立關係，其

備有輔助照護人力深入醫療院所或居家環境之優勢。

　　然而，單位初引進Zenbo時筆者須自行摸索其功能來發想照護措施，且執行中發現語音回饋功能易受環境音影響而中斷、網路連線不穩定、跟隨指令易感測到其他人物而偏移，以及本身重量為10公斤，難以被搬運；高度為62公分，病人坐下後仍需彎腰來互動，加上Zenbo運用僅限於病人住院期間，不同醫療場域的應用尚不普及，若要求家屬自行購買仍有經濟考量或操作問題，皆是本次治療過程的限制。
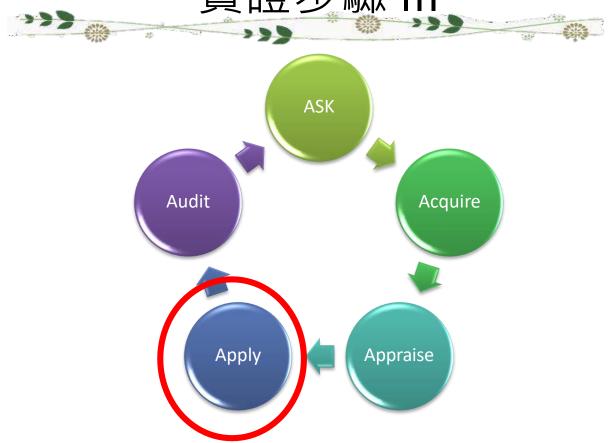
　　建議開發商可建立與護理人員討論機制，針對病人需求為Zenbo進行升級改善，提升使用者接受度；護理人員可舉辦Zenbo操作與應用之教育訓練，提升醫療照護普及率，如：將失智症照護技巧或各科別檢查內容灌入Zenbo，由護理人員引導病人及照顧者與之互動達到衛教效果，探索其運用於各類診斷病人的可能性，亦可推廣Zenbo至日照中心等機構，鼓勵病人至相關機構參與活動，促進照護的連續性。

評讀結果-總表

項目	結果	備註說明
1. Did the review address a clearly focused question?	Yes	PICO清楚
2. Did the authors look for the right type of papers?	Yes	納入RCT
3. Do you think all the important, relevant studies were included?	Yes	5個資料庫
4. Did the review's authors do enough to assess quality of the included studies?	Yes	獨立評析
5. If the results of the review have been combined, was it reasonable to do so?	Can't Tell	PI範圍過大
6. What are the overall results of the review?	ES = 0.586	中等效果
7. How precise are the results?	-1.13~0.04	接近0，精準度？
8. Can the results be applied to the local population?	Yes	
9. Were all important outcomes considered?	Yes	
10. Are the benefits worth the harms and costs?	Yes	

實證步驟 III

聽您說…您很擔心回家如何照顧家中長輩，我這邊有提供幾個方案?你想聽聽看嘛?

除了衛福部長照2.0社區資源與家人陪伴外，還有另一種科技輔助方式。這種方式是基於最新的研究證據指出：使用網路影片、運動裝置、寵物機器狗可減少失智症長輩的激躁行為。(費用跟網路設備)。

好啊

Talk Talk

是否同意將「科技非藥物治療」之內容，加入失智症病人返家照護之衛教選項?

6票　　　　12票　　　　1票