The Efficacy and Safety of Tube Feeding in Advanced Dementia Patients：A Systemic Review and Meta-Analysis Study

Yen-Feng Lee, Tien-Wei Hsu, Chih-Sung Liang, Ta-Chuan Yeh, Tien-Tu Chen, Nal-Ching Chen and Che-She

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背景&動機

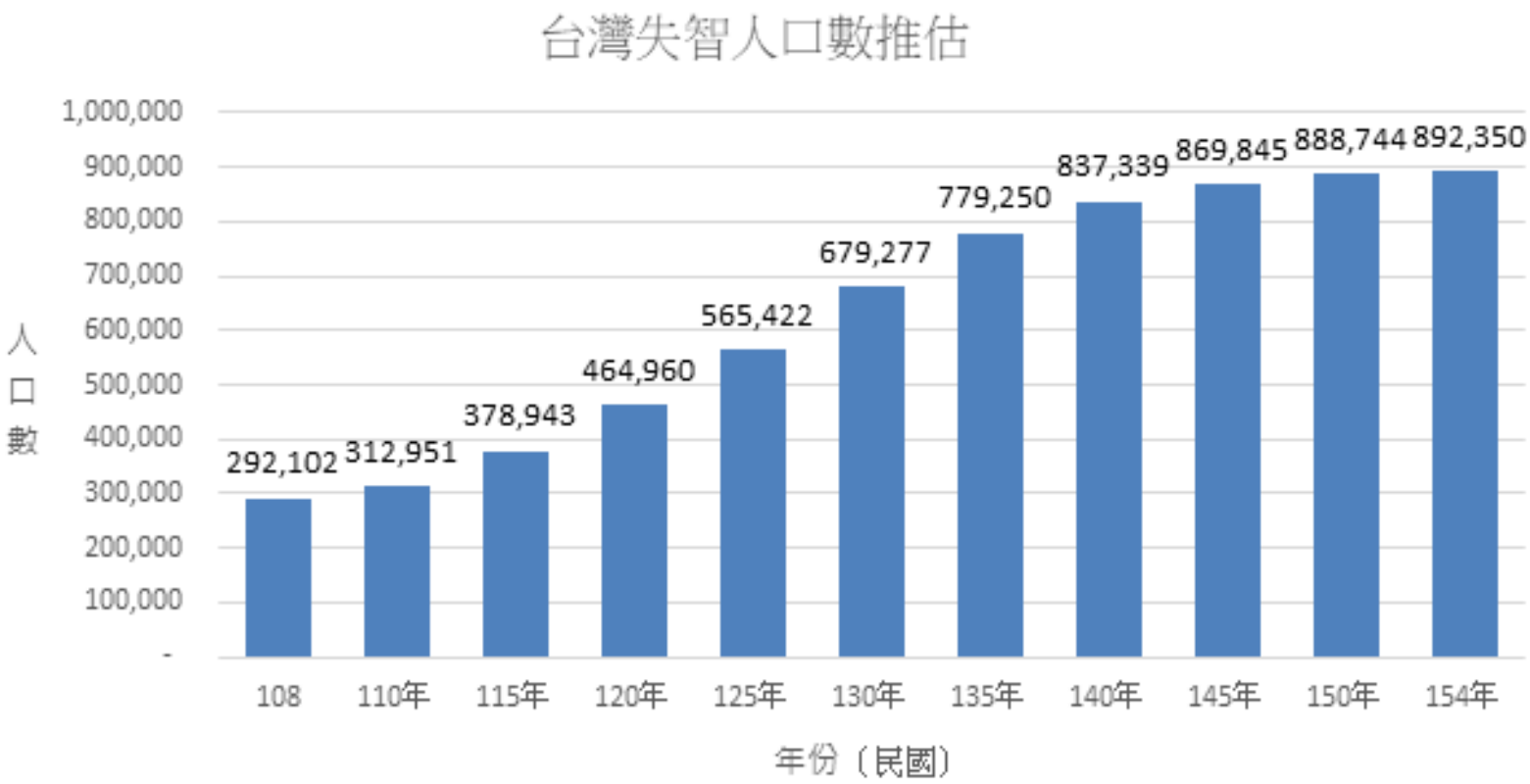
* 依據國際失智症協會（ADI）2019年全球失智症報告，估計全球有超過5千萬名失智者，到2050年預計將成長至1億5千2百萬人。

* 世界衛生組織（WHO）推估，全球平均每三秒新增一名失智症患者；我國失智人口由行政院經濟部指出，台灣在老化速度是全球第三名。

* 台灣社區六十五歲以上老人，每增加五歲失智症盛行率

年齡(歲)	65~69	70~74	75~79	80~84	85~89	≧90
失智症盛行率(%)	3.4	3.46	7.19	13.03	21.92	36.88

＊根據內政部108年12月底人口統計資料、國家發展委員會「中華民國人口中推計（2018年至2065年）」及失智症盛行率推算。



失智症（Dementia）簡介

* 不是單一項疾病，而是一群症狀的組合(症候群)。

* 不單純只有記憶力的減退，還會影響到其他認知功能，包括有語言能力、空間感、計算力、判斷力、抽象思考能力、注意力等各方面的功能退化。

* 同時可能出現干擾行為、個性改變、妄想或幻覺等症狀，嚴重程度足以影響其人際關係與工作能力。

(高、郭、莊，2019)

失智症（Dementia）簡介

* **失智症病人的諸多症狀中，以**吞嚥與進食問題影響86%的末期失智患者，有一半以上的患者會面臨進食困難的問題，這也是造成家屬困擾的問題之一。

* 一旦病人有進食困難問題發生，緊接而來的是體重下降、營養不良、吸入性肺炎 等症狀，進而導致住院頻率與住院天數增加，甚至造成死亡。

* 採用管灌飲食造成的負面影響有：噁心、嘔吐、脹氣、腹瀉、吸入性肺炎、胃出血、皮膚壓瘡及造口處皮膚潰瘍。

(劉、林，2019)

臨床現況

當您面臨年弱體衰時，你/妳的選擇?.....

動機

- 失智症患者一旦由家屬將之送醫，臨床提供的醫療選項，是否能迎合其與家屬的價值觀及尊嚴?
- 臨床醫療人員是否能提供末期失智患者，所有與進食相關的選項 (SDM)?
- 管灌食是否真的能增加失智症患者的存活率?

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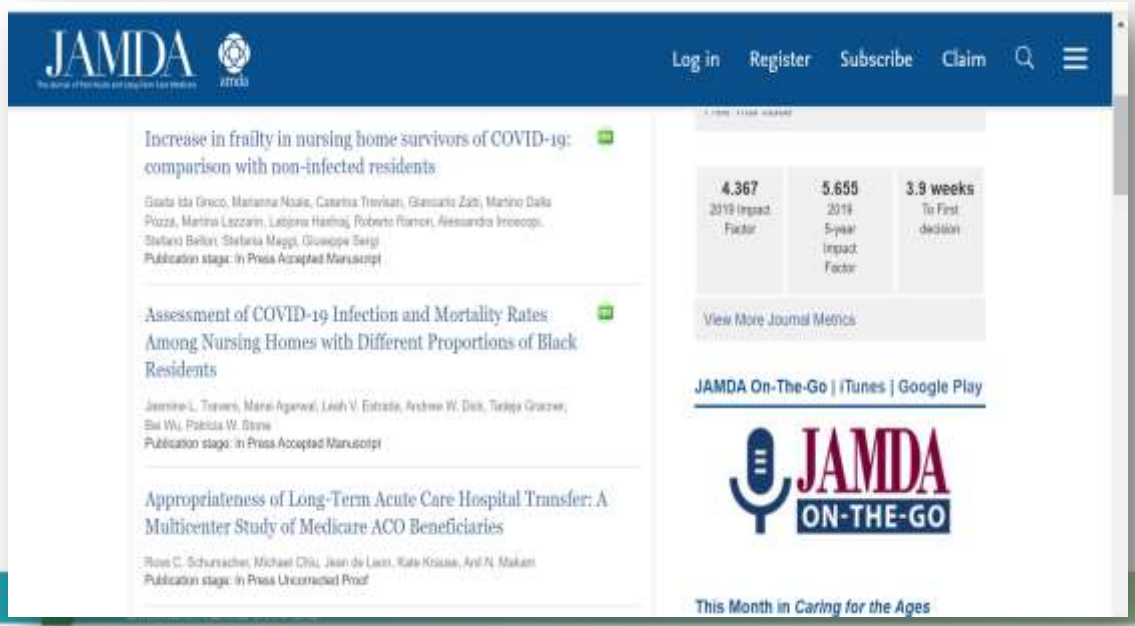

Critical Appraisal Skills Programme(CASP)

FAITH tools

[Meta-analysis]

步驟1：研究探討的問題為何? (PICO)

(內在效度)

步驟2：研究的品質如何? (效益)

步驟3：研究結果之意義為何?

步驟1: 文獻回顧探討問題為何？

P

- Senile Dementia(Advanced)

I

- Oral diet

C

- Feeding diet(NG,PEG)

O

- **primary outcomes：Mean survival time and mortality rate.**
- **secondary outcomes：tube-related complication events and nutritional indices.**

問題類型：●治療型 ○預後型 ○診斷型 ○傷害型

Critical Appraisal Skills Programme(CASP)

FAITH tools

[Meta-analysis]

步驟1：研究探討的問題為何? (PICO)

步驟2：研究的品質如何? (內在效度) (效益)

步驟3：研究結果之意義為何?

良好的文獻搜尋至少應包括二個主要的資料庫(如：Medline, Cochrane 考科藍實證醫學資料庫, EMBASE 等)，並且加上文獻引用檢索、試驗登錄資料等。文獻搜尋應不只限於英文，並且應同時使用 MeSH 字串及一般檢索詞彙。

F (Find)—研究是否找到所有相關證據

Database Searches

The meta-analysis was conducted and reported per the Preferr Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines[14] (Supplementary Table 1). PubMed, Medline, Embase, and Cochrane Library were systematically *searched from the time of* their respective inception until March 7, 2020 (Supplementary Table 2). The search terms used were (enteral nutrition OR percutaneous endoscopic gastrostomy OR nasogastric tube OR tube feeding OR nasogastric feeding OR artificial nutrition) AND (dementia OR demented older patients OR advanced OR Alzheimer disease) AND (serum albumin OR survival OR mortality OR outcome OR pneumonia OR hospital admission OR weight OR hemoglobin OR pressure sore OR BMI) without any limitation on language. The reference lists of included articles and recent reviews were also searched to identify additional references.

Eligibility Criteria and Study Selection

The following eligibility criteria were applied: (1) patients diagnosed with terminal dementia based on criteria set by the Functional Assessment Staging Test (FAST),[15–19] the Clinical Dementia Rating Scale (CDR),[19] the Cognitive Performance Scale (CPS),[20,21] or the Disability Rating Scale (DRS)[22]; (2) a prospective, retrospective, or case-control study reported in a peer-reviewed publication; (3) a comparison between an intervention group and a control group (no tube/artificial feeding); (4) sufficient data for both the intervention group and control group; and (5) articles written in English language.

We excluded case series or case reports. We also excluded review articles that did not report original data. Conference abstracts and studies published in languages other than English were also excluded.

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PubMed、Embase、Medline和Cochrane圖書館的電子數據庫使用MeSH術語和關鍵詞進行了搜索

F(Find)—研究是否找到所有相關證據 (納入及排除條件)

NO

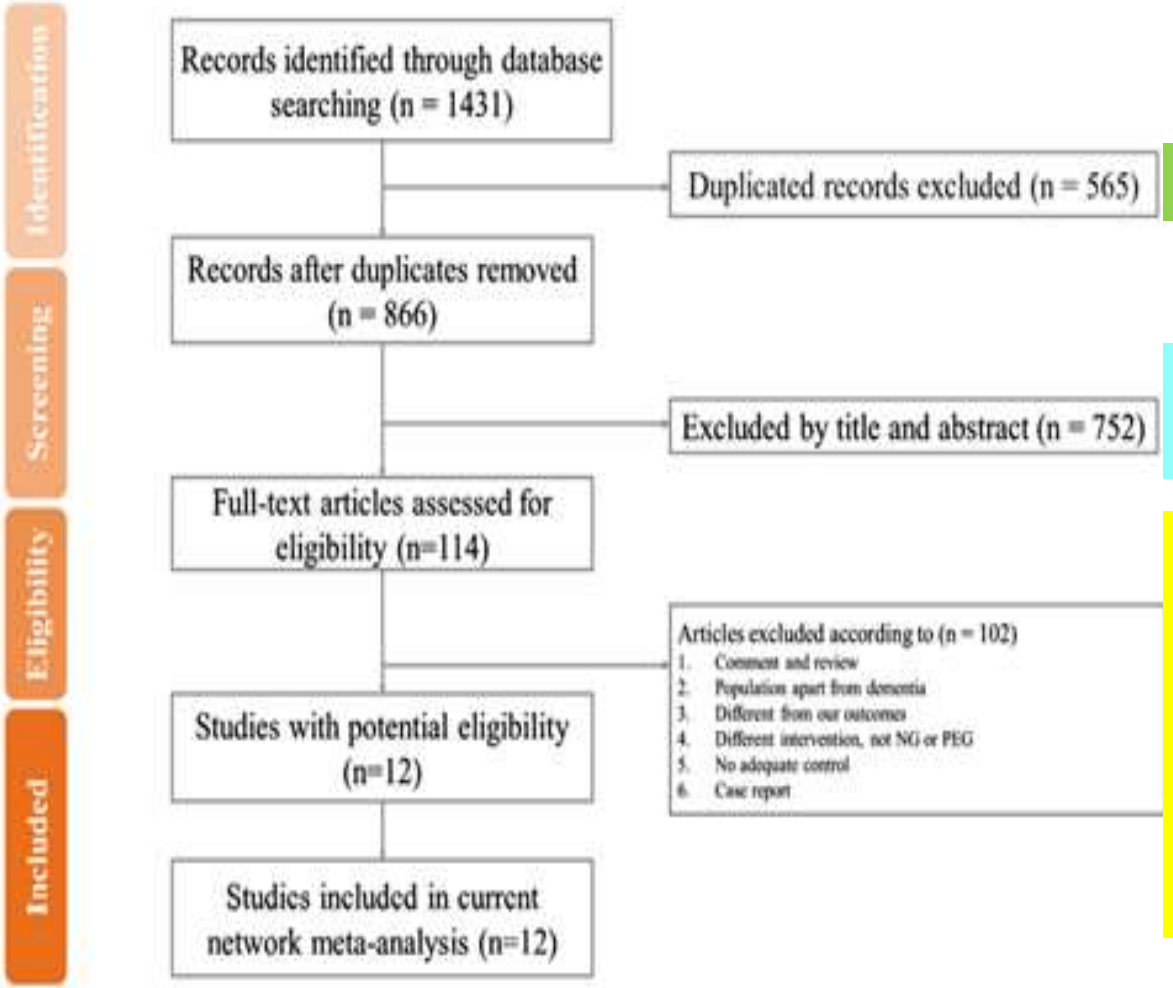
- iagnosed with terminal dementia based on criteria set by the Functional Assessment Staging Test (FAST),15e19 the Clinical Dementia Rating Scale (CDR),19 the Cognitive Performance Scale (CPS),20,21 or the Disability Rating Scale (DRS)22; (2) a prospective, retrospective, or case-control study reported in a peer-reviewed publication; (3) a comparison between an intervention group and a control group (no tube/artificial feeding); (4) sufficient data for both the intervention group and control group; and (5) articles written in English language. We excluded case series or case reports. We also excluded review articles that did not report original data. Conference abstracts and studies published in languages other than English were also excluded.

納入條件

排除條件

只搜尋英文文獻，非英文語言文章就會排除

文獻納入的流程 PRISMA flow diagram



排除重複的文章

閱讀標題及摘要後排除文章

102篇文章排除：

- 1.評論及回顧性
- 2.非失智症患者
- 3.不同的研究結果
- 4.不相關的介入方法
- 5.沒有充分控制
- 6.個案報告

納入文獻特徵(Table I)

醫院及安置

死亡率/存活率

The Characteristics and Demographics of the

Author (year); Country	Criteria	Study Design; Setting	Intervention, n, Control, n	Age (Female, %)	Mortality (%), Survival (d)	Others Outcome	NOS (Total Scores)
Chou et al., 2020[16]; Taiwan	FAST	Prospective cohort; home-care	With NG, 130 Without NG, 39	85.7 ± 7.7 (65) 86.7 ± 6.8 (74)	15, n/a 8, n/a	Pneumonia	8
Ticinesi et al., 2016[19]; Italy	FAST CDR	Prospective cohort; inpatient	With PEG, 54 Without PEG, 130	Total 82.2 ± 7.7 (68.5)	70.4, 240.9 40, 467.2	n/a	7
Cintra et al., 2014[17]; Brazil	FAST	Prospective; in/outpatients	With tube, 31 Without tube, 36	85.6 (93.5) 84.0 (77.8)	58.1, 184 27.8, 236.7	Pneumonia	7
Teno et al, 2012[21]; USA	CPS	Cohort; nursing home	With PEG, 1124 Without PEG, 2082	82.9 ± 7.1 (70.8) 82.7 ± 7.5 (68.7)	n/a	Pressure sore	6
Arinzon et al., 2008[27]; Israel	n/a	Prospective; psychiatric inpatient	With tube, 57 Without tube, 110	70.4 ± 10.5 (82) 80.6 ± 9.0 (72)	42.1, n/a 27.3, n/a	Albumin Hemoglobin Pneumonia Pressure sore BMI	4
Jaul et al., 2006[22]; Israel	DRS	Prospective; nursing home	With NG, 62 Without NG, 26	81 ± 10 (58) 74 ± 12 (30.8)	40.3, 250 65.4, 40	Albumin Hemoglobin BMI	6
Alvarez-Fernández et al., 2005[15]; Spain	FAST	Prospective; nursing home	With NG, 14 Without NG, 53	Total 82.2 ± 6.7 (62)	37.3, 676.8	Cholesterol Albumin Pneumonia	9
Murphy et al., 2003[28]; USA	n/a	Retrospective; outpatient	With PEG, 23 Without PEG, 18	n/a	72, 59 78, 60	n/a	5
Meier et al., 2001[18]; USA	FAST	Prospective; inpatient	With PEG, 68 Without PEG, 31	Total 84.8, (80)	n/a, 198 n/a, 147	n/a	7
Nair et al., 2000[29]; USA	n/a	Prospective; in/outpatient	With PEG, 55 Without PEG, 33	83.3 ± 10 (74.5) 80.4 ± 8.0 (63.6)	44, n/a 26, n/a	Albumin	7
Mitchell et al., 1997[20]; USA	CPS	Prospective; nursing home	With tube, 135 Without tube, 1251	Total 87 (24.6)	20, n/a 15, n/a	n/a	8
Peck et al., 1990[30]; USA	MMSE	Prospective nursing home	With tube, 52 Without tube, 52	87.2 ± 6.8 (86.5) 87.2 ± 6.5 (73.1)	n/a	Pneumonia Pressure sore	5

- 納入1805管灌食(NG、PEG)及3861非管灌食的失智症患者，平均年齡為82-87歲。
- 研究僅包涵失智症病患。
- 管灌飲食有利於營養狀況，但無提高存活率。

I(Included)----是否只納入具有良好效度文章?

NO

Methodological Quality Assessment

Two of the authors extracted data from the included studies inaccordance with a prespecified data extraction form. Any discrep-ancies in the inclusion between the reviewers were resolved by a thirdinvestigator.

The mean modified NOS score was 6.58 (interval range: 4 to 9) in the 12 studies. The modified score in each domain is depicted

But conference abstracts and studies published in languabges other than English were also excluded.

A(Appraisal)---文獻是否經過嚴格評讀

YES

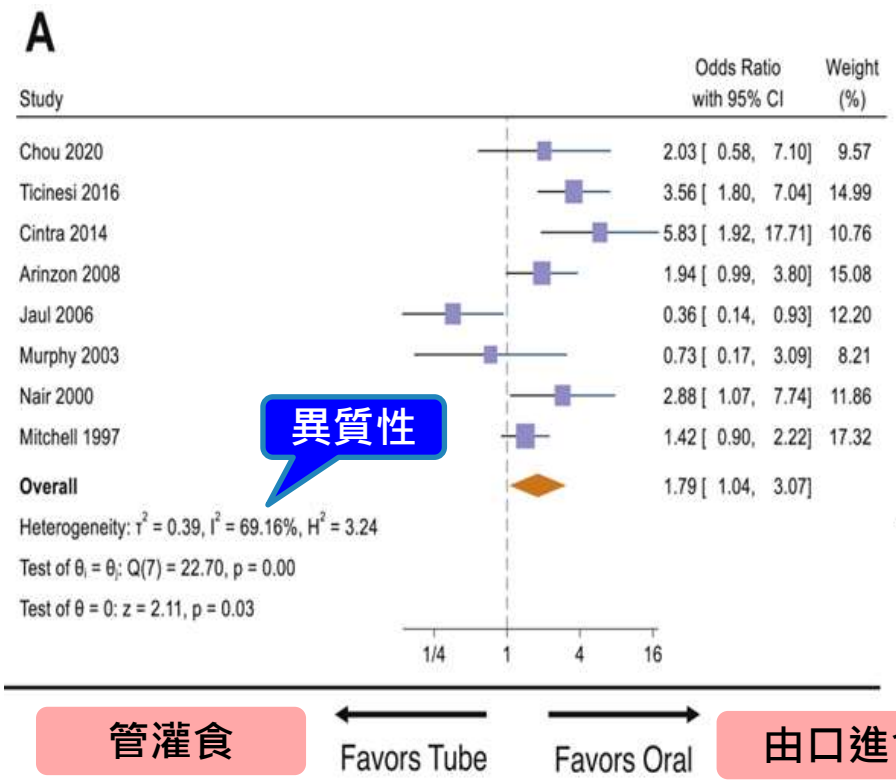
表三 列出納入的試驗研究的偏差風險

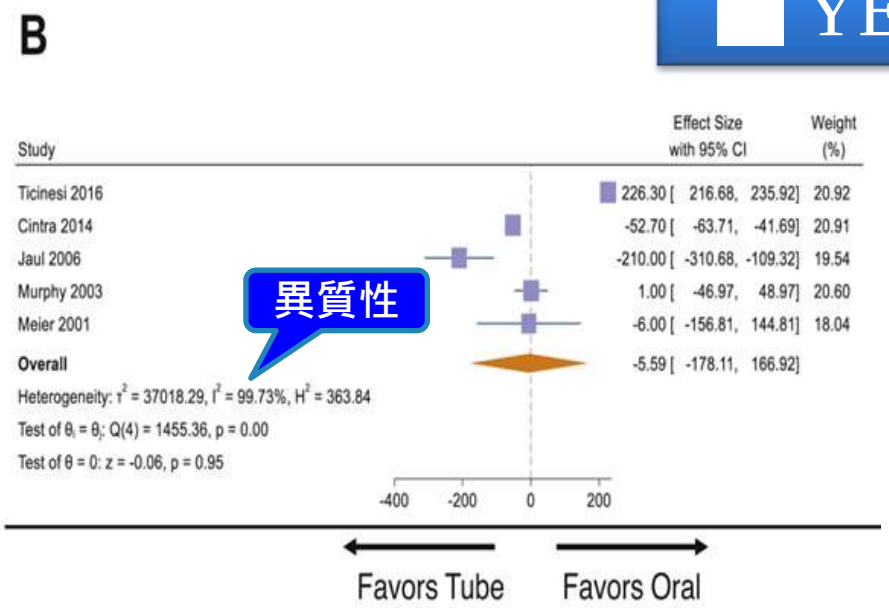
Newcastle-Ottawa Quality Assessment Scale (NOS) scores of included studies
(interval range: 4 to 9)

First Author (year)	Selection	Comparability	Outcome	Total scores
Chou et al., 2020	4	2	2	8
Ticinesi et al., 2016	3	2	2	7
Cintra et al., 2014	2	2	1	5
Teno et al., 2012	2	2	2	6
Arizon et al., 2008	1	1	2	4
Jaul et al., 2006	2	2	2	6
Alvarez-Fernandez et al., 2005	4	2	3	9
Murphy et al., 2003	2	0	3	5
Meier et al., 2001	3	2	2	7
Nair et al., 2000	2	2	3	7
Mitchell et al., 1997	3	2	3	8
Peck et al., 1990	3	0	2	5

T(Total up)+ H----作者是否以表格和圖表試驗結果?

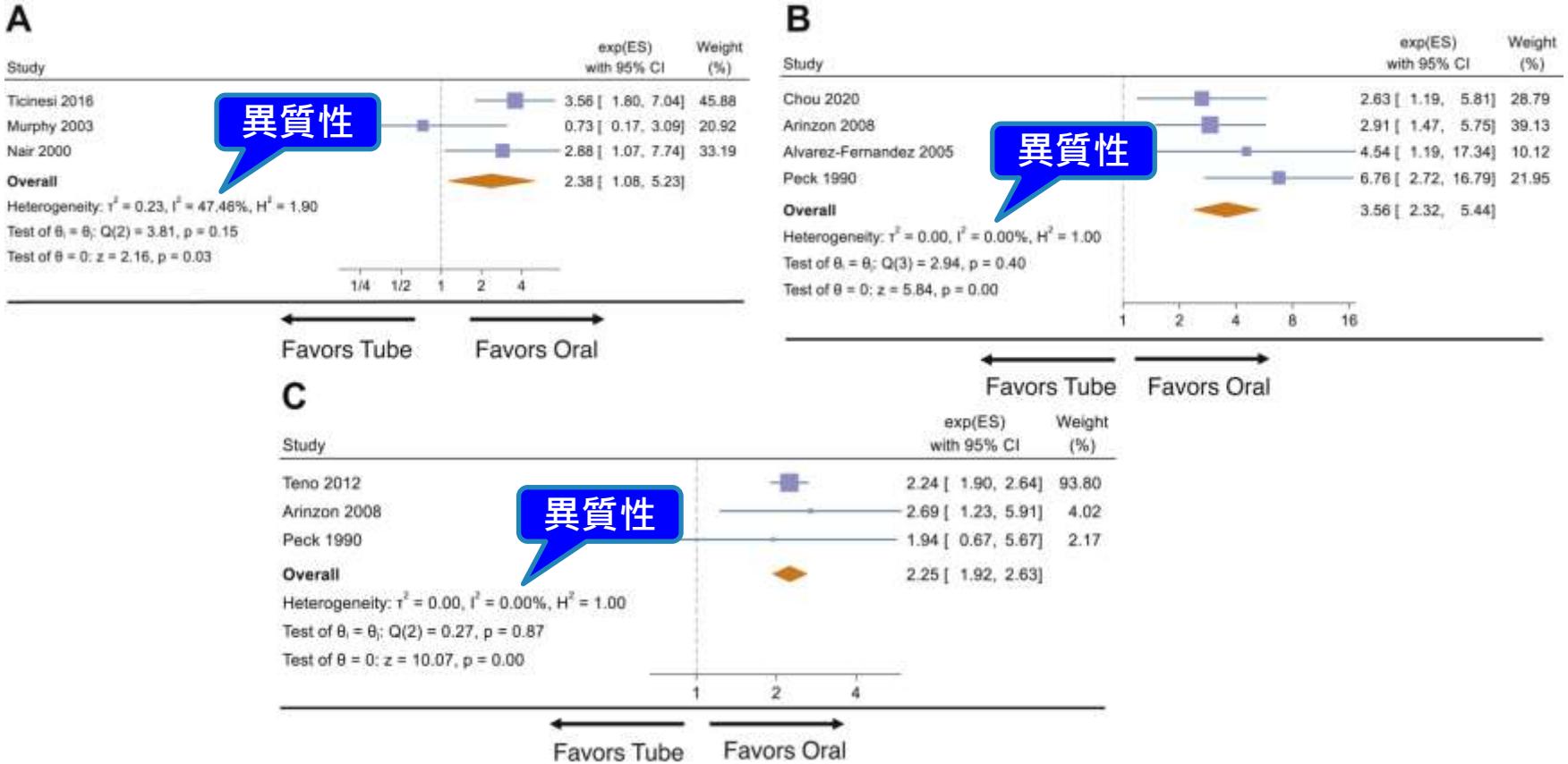
YES





(A) Forest plot of meta-analysis of the risk of mortality in patients with advanced dementia receiving tube feeding and those without tube feeding.
(B) Forest plot of meta-analysis of the survival period in patients with advanced dementia receiving tube feeding and those without tube feeding.

T(Total up)+ H----作者是否以表格和圖表試驗結果?

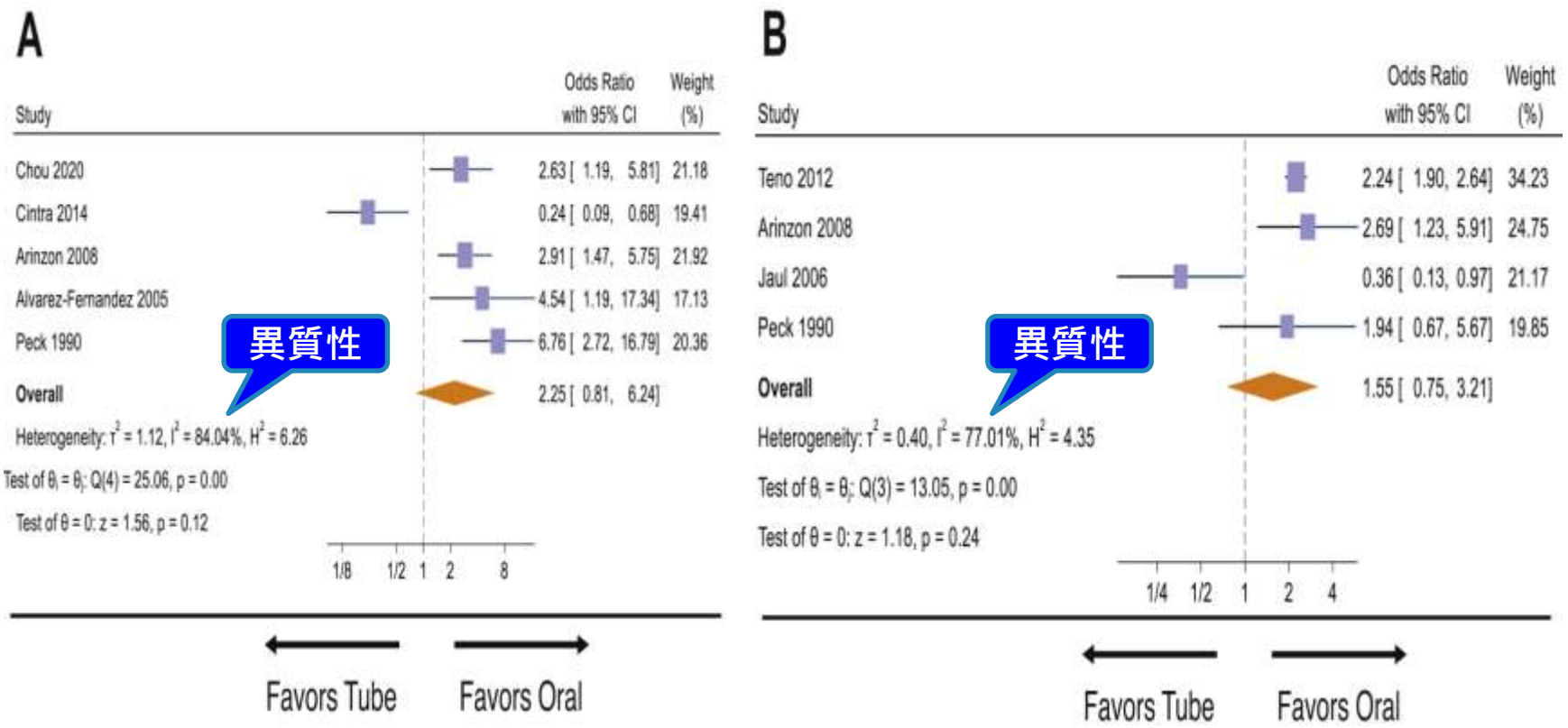


(A) Forest plot of meta-analysis of **risk of mortality rate** in patients with advanced dementia receiving **PEG tube feeding** and those without.

(B) Forest plot of meta-analysis of **risk of pneumonia** in patients with advanced dementia receiving PEG tube feeding and those without: sensitivity analysis of removing.

(C) Forest plot of meta-analysis **of risk of pressure sore** in patients with advanced dementia receiving PEG tube feeding and those without: sensitivity analysis of removing

T(Total up)+ H----作者是否以表格和圖表試驗結果?



(A) Forest plot of meta-analysis of **the risk of pneumonia** in patients with advanced dementia receiving tube feeding and those without tube feeding.

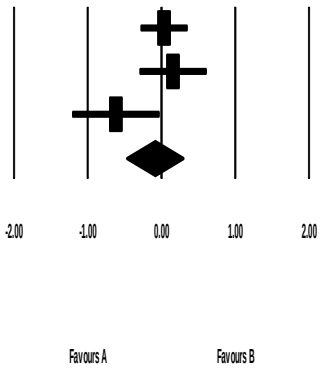
(B) Forest plot of meta-analysis of **the risk of pressure sore** in patients with advanced dementia receiving tube feeding and those without tube feeding.

T(Total up)+ H----作者是否以表格和圖表試驗結果?

Supplemental Table S6: Forest plot of meta-analysis of level of albumin in advanced dementia patients receiving PEG tube feeding and those without

Meta Analysis

Study name	Subgroup within study	Comparison	Outcome	Hedges's g	Standard error	Variance	Lower limit	Upper limit	Z-Value	p-Value
Arinzon 2008	prospective cohort	Tube vs oral	Albumin	0.035	0.162	0.026	-0.283	0.354	0.218	0.828
Jaul 2006	prospective cohort	NG vs oral	Albumin	0.157	0.232	0.054	-0.297	0.612	0.678	0.498
Alvarez Fernandez 2005	prospective cohort	NG vs oral	Albumin	-0.618	0.302	0.091	-1.210	-0.027	-2.049	0.040
				-0.088	0.198	0.039	-0.477	0.301	-0.444	0.657



Secondary Outcome: Nutritional Status
Nutritional status was defined as the mean change from baseline of peripheral albumin in 3 studies,[15,22,27] hemoglobin in 2 studies,[22,27] cholesterol level in 1 study,[15] and weight change[22,27] in 2 studies. With regard to albumin, no significant difference among patients with advanced dementia with tube feeding was observed compared to those without tube feeding (k = 3, Hedges' g = −0.09; 95% CI −0.48 to 0.30; P = .657) There was no evidence of either publication bias (Egger regression test, P = .515) or of heterogeneity (Q value = 4.61, df = 2, I^2 = 56.62, P = .100). No meta-regression was performed due to fewer than 5 studies being included. For fewer than 3 studies, we could not perform a meta-analysis.

晚期失智症患者，有管灌飲食與沒有管灌飲食的患者之營養狀態，沒有顯著差異（k = 3，Hedges' g = =0.09;95% CI =0.48 至 0.30：P = 。657）

結論

1. heterogeneous articles suggest that compared tube feeding (TF)with no-tube feeding (TF), **TF had higher mortality** and those **with PEG showed higher mortality rate**.

2. Second, **tube feeding did not prolong** the **survival period.**

3. Third, sensitivity analysis demonstrated that **TF has a high risk of pneumonia** and **pressure sores** compared with no-TF.

☆ Finally, tube feeding **did not improve nutritional status,** including albumin levels, hemoglobin levels, and cholesterol concentration.

Q & A討論交流時間：

請問您是否贊成，晚期失智症患者由口進食，以提升其生活品質？

不同意　　需要更多證據　　同意

Q & A討論交流時間：

請問您是否贊成，晚期失智症患者由口進食，以提升其生活品質？

同意：3票

仍有疑慮 : 28票

不同意：1票

謝謝聆聽

Thanks for your listening