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目錄

序號	題目	主講人	頁碼
1	不同灌溉模式對土壤微生物族群結構及酵素活性之影響	張義宏	1
2	滲出性肋膜積液中CX3CL1與促纖維化因子協同效應之研究	陳偉玲	3
3	台灣肖楠 (Calocedrus formosana) 萃取精油及其商品化精油之抑菌活性研究	張讚昌	5
4	探討首次臨床實習運用Nidra Yoga對護理學生實習壓力、睡眠品質及學業復原力的影響	李瑾婷	7
5	五專高年級護生對中風症狀的認知、預期因應行為及態度探討	王寶鈺	9
6	探討護生參與國際英語專業詞彙能力認證之動機及經驗	孫惠玲	11
7	發展新進護理人員之安寧緩和護理的可信賴專業活動	楊嘉玲	13
8	嬰兒粗大肢體動作活動設計之行動研究	周佩諭	16

目錄

序號	題目	主講人	頁碼
9	大專餐飲管理科系學生永續素養指標	陳家蓁	18
10	epsilon-Viniferin經由旁分泌作用與自噬改善C2C12細胞損傷後再生能力之研究	張靜雯	20
11	山葵葉根萃取物之生物活性與化妝品應用研究	陳觀彬	22
12	使用3D列印技術之微流體裝置生產granisetron hydrochloride滴丸	陳睿能	25
13	由司法裁判案件分析違反殯葬管理條例之類型與原因	施秋蘭	27
14	機器人劇場之沉浸式學習於護理科學生情感學習之成效	黃素妃	30
15	臺灣省運動會女性軟式網球選手跨項目參賽情形初探	陳建森	32
16	史記人物敘事研究	劉錦源	35

不同灌溉模式對土壤微生物族群結構及酵素活性之影響

張義宏

中文摘要：

本研究旨在探討不同節水型灌溉管理對稻田土壤微生物群落結構與多樣性的影響。實驗設置三種灌溉處理，分別為連續淹水灌溉(Continuous Flooding, CF)、每九天灌溉(Periodic Irrigation, PI)以及乾溼交替灌溉(Alternate Wetting and Drying, AWD)，藉由比較不同灌溉模式下的用水量與土壤微生物群落變化，評估節水灌溉對稻田微生物生態系統之影響。研究假設相較於連續淹水灌溉，PI 與 AWD 可降低用水量並增加土壤氧氣供應，進而改變土壤微生物群落組成，並可能影響溫室氣體排放潛勢。

本研究結合磷脂脂肪酸分析(PLFA)與次世代定序技術，以解析土壤微生物活性、生物量及群落組成變化。結果顯示，不同灌溉處理下，土壤 pH 值及碳、氮含量並未呈現顯著差異，惟土壤微生物多樣性與豐度則受到灌溉管理的顯著影響。PI 處理顯著提升土壤微生物多樣性，但同時降低整體微生物族群數量；相較之下，AWD 與 CF 處理間在微生物多樣性與豐度上差異不明顯。群落結構分析顯示，PI 處理下細菌與真菌多樣性均有所提升，其中廣古菌門(Euryarchaeota)之甲烷生成菌為主要優勢菌群，而真菌群落則以子囊菌門(Ascomycota)占主導地位。

整體而言，本研究結果顯示灌溉管理為影響稻田土壤細菌與真菌群落結構之關鍵環境因子，其中 AWD 對微生物群落的擾動相對較小，兼具節水與生態穩定性潛力，為稻田土壤管理及永續農業發展提供重要的科學依據。

關鍵字：次世代定序、微生物族群、磷脂脂肪酸。

英文摘要：

This study investigated the effects of different water-saving irrigation regimes on soil microbial community structure and diversity in paddy fields. Three irrigation treatments were established: continuous flooding (CF), periodic irrigation every nine days (PI), and alternate wetting and drying (AWD). By comparing water use and soil microbial responses under different irrigation regimes, this study evaluated the ecological impacts of water-saving irrigation on paddy soil microbial communities. It was hypothesized that, compared with continuous flooding, PI and AWD would reduce water consumption and enhance soil oxygen availability, thereby altering microbial community composition and potentially influencing greenhouse gas emission processes.

Phospholipid fatty acid (PLFA) analysis combined with next-generation sequencing was employed to assess microbial biomass, activity, and community composition. The results indicated that soil pH and total carbon and nitrogen contents did not differ significantly among irrigation treatments. However, soil microbial diversity and abundance were markedly affected by irrigation management. The PI treatment significantly increased microbial diversity while reducing overall microbial abundance. In contrast, no pronounced differences in microbial diversity or abundance were observed between the AWD and CF treatments. Community composition analysis revealed that PI enhanced both bacterial and fungal diversity, with methanogenic archaea belonging to the phylum Euryarchaeota emerging as the dominant archaeal group, while fungal communities were primarily dominated by Ascomycota.

Overall, the findings demonstrate that irrigation management is a key environmental factor shaping soil bacterial and fungal community structures in paddy fields. Among the evaluated practices, AWD exerted relatively minor disturbances on soil microbial communities while maintaining water-saving potential, highlighting its suitability as a sustainable irrigation strategy for paddy soil management and environmentally sound agricultural production.

Key words: Next Generation Sequencing, microbial community, PLFA

滲出性肋膜積液中 CX3CL1 與促纖維化因子協同效應之研究

陳偉玲

中文摘要：

結核性肋膜積液 (tuberculous pleural effusion, TBPE) 為臨床上常見之滲出性肋膜積液，且可能進展為肋膜纖維化，進而導致不可逆之胸廓功能障礙，並影響病人生活品質。趨化激素 CX3CL1 及其受體 CX3CR1 已知為調控發炎與纖維化反應的重要因子，然而其於 TBPE 中之臨床意義仍未完全釐清。

本研究以免疫轉漬法及酵素連結免疫吸附分析法測定 TBPE 病人 (n = 36) 及心衰竭所致之滲出性肋膜積液病人 (n = 10) 肋膜液中可溶性 CX3CL1 (sCX3CL1) 與 CX3CR1 (sCX3CR1) 之濃度，並於接受 6 個月抗結核治療後，以胸部 X 光評估肋膜增厚的情形。此外，為探討其潛在機轉，以人類肋膜間皮細胞株 MeT-5A 進行體外實驗，給予重組 CX3CL1 (20 ng/mL) 刺激，並於有無 CX3CR1 基因敲降之情況下，利用西方墨點法分析 TGF- β 1 表現。

研究結果顯示，TBPE 病人肋膜液中 sCX3CL1 與 sCX3CR1 濃度顯著高於滲出性肋膜積液，且兩者呈現正相關。進一步分析發現，於 6 個月抗結核治療後產生肋膜增厚之 TBPE 病人，其 sCX3CL1 與 sCX3CR1 濃度顯著高於未產生肋膜增厚者。體外實驗結果顯示，CX3CL1 可顯著誘導 MeT-5A 細胞中 TGF- β 1 的表現，而抑制 CX3CR1 則可明顯減弱 CX3CL1 所誘發之 TGF- β 1 上調作用。

綜上所述，肋膜液中 sCX3CL1 與 sCX3CR1 的升高與 TBPE 及殘餘肋膜纖維化之發生具有顯著相關性。CX3CL1 可透過 CX3CR1 訊號傳遞促進肋膜間皮細胞中具纖維化特性的 TGF- β 1 表現，顯示 CX3CL1/CX3CR1 軸線於 TBPE 之肋膜纖維化過程中扮演關鍵角色，並可能成為未來治療之潛在標的。

關鍵字：CX3CL1/CX3CR1 軸線、肋膜纖維化、結核性肋膜積液。

英文摘要：

Tuberculous pleural effusion (TBPE) is a common cause of exudative pleural effusion in clinical practice and may progress to pleural fibrosis, leading to irreversible thoracic dysfunction and impaired quality of life. The chemokine CX3CL1 and its receptor CX3CR1 are known regulators of inflammatory and fibrotic responses; however, their clinical significance in TBPE remains unclear.

Pleural fluid levels of soluble CX3CL1 (sCX3CL1) and soluble CX3CR1 (sCX3CR1) were measured by immunoblotting and enzyme-linked immunosorbent assay in patients with TBPE (n = 36) and transudative effusions due to heart failure (n = 10). Residual pleural thickening (RPT) was assessed by chest radiography after 6 months of anti-tuberculosis treatment. Mechanistic studies were performed in human pleural mesothelial MeT-5A cells stimulated with recombinant CX3CL1 (20 ng/mL), with or without CX3CR1 knockdown, followed by analysis of TGF- β 1 expression by Western blotting.

Levels of sCX3CL1 and sCX3CR1 were significantly higher in TBPE than in transudative effusions and were positively correlated. Both markers were significantly elevated in TBPE patients who developed residual pleural thickening (RPT \geq 10 mm) compared with those without RPT. In vitro, CX3CL1 stimulation significantly increased TGF- β 1 expression in MeT-5A cells, whereas knockdown of CX3CR1 markedly attenuated CX3CL1-induced TGF- β 1 upregulation.

Elevated pleural sCX3CL1 and sCX3CR1 levels are associated with TBPE and the development of residual pleural fibrosis. CX3CL1 promotes profibrotic TGF- β 1 expression through CX3CR1 signaling in pleural mesothelial cells, suggesting that the CX3CL1/CX3CR1 axis may represent a potential therapeutic target in TBPE.

Key words: CX3CL1/CX3CR1 axis、pleural fibrosis、tuberculous pleural effusion

中文摘要：

台灣肖楠（*Calocedrus formosana* Florin），又被稱為肖楠、台灣翠柏、黃肉樹，屬於柏科（*Cupressaceae*）肖楠屬（*Calocedrus*）之常綠高大喬木，該屬目前僅存 4 種，台灣肖楠為其中一種也是台灣本地特有樹種，主要分部在台灣北部及中部海拔 300 至 1900 公尺之山地，亦為台灣本土海拔 500 至 1800 公尺之溫帶造林樹種。台灣肖楠材質細密，不受白蟻蠹蝕，常被用為建築、家具、棺木、雕刻及裝飾材，台灣肖楠的枝葉及木材碎片經過蒸餾過程可以製成精油，學者指出台灣肖楠含有扁柏黃酮（hinokiflavone），具有抗黴菌、抗菌及抗發炎活性等生理功能；期能透過對台灣肖楠萃取精油之抑菌活性，來呼籲大家重視對台灣肖楠原木的保護及保育。本研究以台灣本土特有台灣肖楠為試驗材料，取其莖葉材料經蒸餾萃取以製成台灣肖楠精油，並以紙錠擴散法（disc agar diffusion test）及肉湯試管稀釋法（tube dilution test）來探究台灣肖楠萃取精油對臨床常見致病菌，如 *Bacillus subtilis* (ATCC11774) 枯草桿菌，*Escherichia coli* (ATCC25922) 大腸桿菌，*Pseudomonas aeruginosa* (ATCC19429) 綠膿桿菌，*Staphylococcus aureus* (ATCC6538) 金黃色葡萄球菌等之抑菌能力，同時比較商品化台灣肖楠精油及其主要成分扁柏黃酮（hinokiflavone）之抑菌能力，以開發台灣肖楠精油作為天然保鮮抗菌劑之依據。

關鍵字：台灣肖楠精油、扁柏黃酮、抑菌活性、枯草桿菌、大腸桿菌、綠膿桿菌、金黃色葡萄球菌。

英文摘要：

Calocedrus formosana Florin, also known as *Calocedrus formosana*, *Calocedrus macrolepis*, and yellow flesh tree, is a tall evergreen tree belonging to the genus *Calocedrus* in the family Cupressaceae. There are currently only 4 species of this genus left in the world. *Calocedrus formosana* is one of the tree species that is endemic to Taiwan. It is mainly found in the mountainous areas of northern and central Taiwan at an altitude of 300 to 1,900 meters. It is also a temperate afforestation tree species native to Taiwan at an altitude of 500 to 1,800 meters. *Calocedrus formosana* is made of fine material and is not corroded by termites. It is often used as construction, furniture, coffins, carvings and decorative materials. The branches, leaves and wood fragments of *Calocedrus formosana* can be made into essential oil through the distillation process. Scholars point out that *Calocedrus formosana* contains hinokiflavone. Hinokiflavone has physiological functions such as antifungal, antibacterial and anti-inflammatory activities. Through the antibacterial activity of the essential oil extracted hinokiflavone from *Calocedrus formosana*, we are calling on everyone to pay attention to the protection and conservation of *Calocedrus formosana*. This study uses Taiwan's unique *Calocedrus formosana* as the test material. Its stems and leaves were distilled and extracted to make *Calocedrus formosana* essential oil. The paper ingot disc agar diffusion test and the broth test tube dilution method were used. The antibacterial ability of essential oil extracted from *Calocedrus formosana* on common clinical pathogenic bacteria, such as *Bacillus subtilis* (ATCC11774), *Escherichia coli* (ATCC25922), *Pseudomonas aeruginosa* (ATCC19429), *Staphylococcus aureus* (ATCC6538) etc. It is also compared with the antibacterial ability of commercialized *Calocedrus formosana* essential oil and its main component hinokiflavone, in order to develop the basis for developing *Calocedrus formosana* essential oil as a natural antibacterial agent for freshness.

Key words: *Calocedrus formosana* essential oil, hinokiflavone, antibacterial activity, *Bacillus subtilis*, *Escherichia coli*, *Pseudomonas aeruginosa*, *Staphylococcus aureus*

中文摘要：

本研究主旨探討首次臨床實習運用 Nidra Yoga 對護理學生實習壓力、睡眠品質及學業復原力的影響。本研究採方便取樣方式，研究對象為某台北市醫護管理專科學校護理科學生為研究者未教授的二年級其中 2 個班級學生作為研究對象，經過解釋，以願意填寫同意書及問卷之護生。為有效觀測「運用 Nidra Yoga」對護理學生實習壓力、睡眠品質及學業復原力的影響，以實驗設計方式將學生分為實驗組與控制組。其中選取自願參與「運用 Nidra Yoga」實驗活動的學生作為實驗組對象，一班總計參與人數為 45 人；而接受傳統教學法的學生則為控制組為 45 人，總計 90 人。以 SPSS26.0 for window 統計軟體做分析。研究結果發現：1. 實驗組與控制組在各項基本資料均無顯著差異 ($p > .05$)。2. 實習壓力量表的 GEE 分析摘要結果，結果顯示實驗組與控制組從前測到後測的改變幅度（交互作用項：「實驗組 x 後測」）在壓力量表各分層面與總平均分數均達顯著差異 ($p < .05$)，且交互作用皆為負值，表示實驗組的壓力降低幅度比較大。3. 學業復原力量表的 GEE 分析摘要結果，結果顯示實驗組相對於對照組在學業復原力量表的各分層面與總平均分數均達顯著差異 ($p < .05$)，且交互作用皆為正值，表示實驗組的進步幅度比較大。4. 睡眠品質的比較，睡眠品質分數愈高代表睡眠狀況愈差，分數愈低代表睡眠狀況愈佳。結果顯示整體而言兩組在睡眠品質各個面向（除了睡眠效率與睡眠困擾）及總得分均達顯著差異 ($p < .05$)，且交互作用皆為負值，表示實驗組相較於控制組，睡眠品質變好的幅度比較大。

結論：本研究證實，透過運用 Nidra Yoga 對護理學生實習壓力、睡眠品質及學業復原力極大幫助。Nidra Yoga 作為一項靜態身心放鬆技術，能有效降低護理學生首次臨床實習期間的壓力、提升學業復原力並改善睡眠品質，顯示其可作為護理教育中促進學生身心調適與實習適應的重要介入策略。建議未來可擴大樣本、延長追蹤時間或納入不同臨床科別，以進一步探討其長期效果與普遍性。

關鍵字：首次臨床實習、Nidra Yoga、護理學生實習壓力、睡眠品質、學業復原力。

英文摘要：

The purpose of this study was to examine the effects of Nidra Yoga on practicum-related stress, sleep quality, and academic resilience among nursing students during their first clinical practicum. Convenience sampling was used, and participants were second-year nursing students from two classes in a nursing department at a medical and health management junior college in Taipei. Only students who provided informed consent and agreed to complete the questionnaires were included. To examine the effects of Nidra Yoga, a quasi-experimental design was adopted. Students who voluntarily participated in the Nidra Yoga intervention formed the experimental group ($n = 45$), while those receiving traditional instruction served as the control group ($n = 45$), yielding a total sample of 90 participants. Data were analyzed using SPSS 26.0 for Windows. Results : 1. significant differences were found between the experimental and control groups in baseline characteristics ($p > .05$). 2. Generalized Estimating Equation (GEE) results showed significant interaction effects (“group \times posttest”) for all subscales and the total score of the practicum stress scale ($p < .05$). All interaction coefficients were negative, indicating a greater reduction in stress among students in the experimental group compared with the control group. 3. GEE analysis of the academic resilience scale revealed significant differences between groups across all subscales and the total score ($p < .05$). All interaction coefficients were positive, indicating that the experimental group demonstrated greater improvement in academic resilience. 4. Regarding sleep quality, higher scores indicated poorer sleep. Except for sleep efficiency and sleep disturbance, all other subscales and the total score showed significant differences between groups ($p < .05$). All interaction coefficients were negative, suggesting that the experimental group experienced greater improvements in sleep quality compared with the control group. Conclusion : This study confirmed that Nidra Yoga provides substantial benefits for nursing students during their first clinical practicum. As a passive mind – body relaxation technique, Nidra Yoga effectively reduces practicum-related stress, enhances academic resilience, and improves sleep quality. These findings suggest that Nidra Yoga can serve as an important educational intervention to support psychological adjustment and practicum adaptation among nursing students. Future studies should consider expanding the sample size, extending the follow-up period, and including students from different clinical specialties to further examine the long-term effects and generalizability of the intervention.

Key words: first clinical practicum, Nidra Yoga; nursing students' practicum-related stress; sleep quality; academic resilience

五專高年級護生對中風症狀的認知、預期因應行為及態度探討

王寶鈺

中文摘要：

中風是全球成年人失能和死亡的重要原因。然而，提高青少年對中風及其風險因素的認識，有助於預防中風的發生，並能增強他們在緊急情況下的反應能力。本研究目的探討五專高年級護生對中風症狀的認知、預期因應行為及態度的關係。本研究結果發現大專生的中風症狀認知以接近平均水準（19.6-23.5分）為居多佔69.2%；大專生的中風預期因應行為以低於平均水準（0-19分）為居多佔58.5%；受試者「年齡」與中風預期因應行為有顯著的相關($r = 0.23, p < 0.05$)；受試者「實習曾照護中風個案」與中風預期因應行為有顯著的差異($t = 2.75, p < 0.05$)。建議在實習或課程設計中增加中風個案照護經驗，透過實務接觸強化學生的臨場反應與行為決策能力，縮小認知與行動之間的落差。

關鍵字：高年級護生、中風症狀的認知與預期因應行為、中風識別與應變態度。

英文摘要：

Stroke is a major cause of disability and mortality among adults worldwide. Enhancing adolescents' awareness of stroke and its risk factors can help prevent stroke onset and improve their ability to respond effectively in emergency situations. This study aimed to examine the relationships among stroke symptom recognition, anticipated coping behaviors, and attitudes among senior five-year nursing students. The findings showed that most students demonstrated a near-average level of stroke symptom recognition (19.6–23.5 points; 69.2%). However, their anticipated coping behaviors were predominantly below the average range (0–19 points; 58.5%). A significant correlation was found between participants' age and anticipated coping behaviors ($r = 0.23, p < 0.05$). Additionally, students who had cared for stroke patients during clinical practicum showed significantly higher anticipated coping behaviors than those without such experience ($t = 2.75, p < 0.05$). It is recommended to incorporate more stroke-related patient care experiences into clinical practicum or curriculum design. Through hands-on exposure, students may strengthen their situational response and decision-making abilities, thereby narrowing the gap between cognitive knowledge and actual behavioral performance

Key words: Senior nursing students, Knowledge of stroke symptoms and anticipated coping behaviors, Stroke recognition and response attitudes.

中文摘要：

在護理工作上專業字詞是溝通及閱讀重要的媒介，英語是專業詞彙最常使用的語言，熟悉這些專業字詞集的意義、發音且能拼寫，形成生活習慣式、直覺反應式的專業應用能力，是在專業領域具備國際化的學習與溝通能力。然而，多數護生對英語學習感到害怕、焦慮甚至放棄。面對學生學習專業術語恐懼、缺乏自信心及學習策略缺乏、導致缺乏學習興趣。然而，經由專業術語的課程後，護生選擇參與 PVQC 專業英語詞彙國際認證獲取證照的動機及經驗，及對其學習專業英語的影響尚未有文獻探討，因此，本計畫擬探討護生參與國際英語專業詞彙能力認證之動機及經驗。以立意取樣，採量性研究設計，邀請 89 位學習醫護術語且運用 PVQC 平台檢測英語專業詞彙能力。運用學習經驗量表為研究工具，研究結果發現，導入 PVQC 專業英語詞彙學習平台之課程，能有效提升五專護生之專業英語詞彙能力，期末整體表現顯著優於期中。多數護生於課程結束後可達到 PVQC A2 等級，顯示本教學模式有助於學生達成國際基礎專業英語能力標準。護生使用 PVQC 平台之學習動機以「切身相關」與「建立信心」構面表現最佳，顯示學生能理解學習內容與未來專業應用之關聯。PVQC 學習動機與學生對護理及英語之態度與價值認知具有顯著正向關聯，惟與短期測驗成績之直接關係尚未達顯著。未來可結合 ARCS 動機策略，強化學習回饋與成就展現機制，以提升學生之學習滿足感。後續研究可採縱貫研究設計，追蹤學習動機對證照取得與臨床實務應用之長期影響。

關鍵字：學習經驗、專業英語詞彙國際認證、護生。

英文摘要：

In nursing, professional vocabulary is a crucial medium for communication and reading. English is the most frequently used language for professional terminology. Familiarity with the meaning, pronunciation, and spelling of these professional terms fosters habitual and intuitive professional application skills, enabling international learning and communication abilities in the professional field. However, many nursing students experience fear, anxiety, or even give up on learning English. Students' fear of professional terminology, lack of confidence, and lack of learning strategies lead to a lack of interest in learning. However, there is a lack of literature exploring the motivation and experience of nursing students choosing to participate in the PVQC professional English vocabulary international certification program after completing professional terminology courses, and its impact on their professional English learning. Therefore, this project aims to explore the motivation and experience of nursing students participating in international English professional vocabulary proficiency certification. Using a purposive sampling and quantitative research design, 89 students who learned medical and nursing terminology were invited to use the PVQC platform to assess their English professional vocabulary proficiency. Using a learning experience scale as the research tool, the results show that courses incorporating the PVQC professional English vocabulary learning platform effectively improved the professional English vocabulary proficiency of five-year vocational nursing students, with overall final performance significantly better than midterm. Most nursing students achieved PVQC A2 level upon completion of the course, demonstrating that this teaching model helps students reach international basic professional English proficiency standards. Students' learning motivation using the PVQC platform showed the best performance in the "relevance" and "confidence-building" dimensions, indicating that students understand the connection between the learning content and future professional applications. PVQC learning motivation has a significant positive correlation with students' attitudes and values towards nursing and English; however, its direct correlation with short-term test scores is not yet significant. Future research could incorporate ARCS motivation strategies to strengthen learning feedback and achievement recognition mechanisms, thereby enhancing students' learning satisfaction. Further research could employ a longitudinal research design to track the long-term impact of learning motivation on certification acquisition and clinical practice.

Key words: Learning experience, professional vocabulary Quotient Credential, nursing students

中文摘要：

背景與研究目的：

隨著以能力為本的醫學教育逐步取代傳統以知識傳遞為核心的教學模式，如何將課程中培養的核心能力有效銜接並轉化為臨床工作場域中的實際勝任表現，已成為當前醫護教育的重要課題。可信賴專業活動（Entrustable Professional Activities, EPAs）被視為具體呈現專業人員可被授權執行之關鍵工作任務，能依學習者臨床表現逐步賦予實務責任，反映其專業成熟度。本研究旨在建構適用於安寧療護新進護理人員之成人安寧緩和護理可信賴專業活動（Hospice – Palliative Care EPAs, H-P-C EPAs），發展其核心主題與具體項目內容。

研究方法：

本研究採描述性研究設計，分兩個階段進行。第一階段以系統性文獻查證法，彙整並分析現有 EPAs 於安寧緩和醫護教育中之發展現況與應用成效，以建構初步 H-P-C EPAs 架構。第二階段採德爾菲研究法，邀請具安寧療護、護理實務、教學及 EPAs 相關經驗之七位專家，透過多回合匿名諮詢，逐步確認成人安寧緩和護理新進人員所需之核心 EPAs 主題與項目內容。

研究結果：

第一階段系統性文獻查證共納入 20 篇核心文獻，經深入分析後形成初步之 H-P-C EPAs 主題、定義及次項目。第二階段德爾菲法第一回合共產生 60 項指標題項，以中位數 ≥ 4 分判定為「重要」、四分位距 < 0.6 判定為「高度一致性」，同時符合標準者進入後續第二至第四回合專家共識程序。最終彙整結果顯示，成人安寧緩和護理可信賴專業活動共包含 8 大能力構面、23 項次構面、44 項具體 EPAs。

結論：

本研究結果有助於釐清成人安寧緩和護理新進護理人員之核心工作任務與可被信賴之專業活動內涵，為 EPAs 導入安寧護理教育與臨床培訓提供結構化依據。建議後續研究可進一步進行 H-P-C EPAs 之評量指標（如 EQual Rubric Items）信效度驗證，並據以發展兼具教育與臨床實務應用之完整成人安寧緩和護理 EPAs 評核工具。

關鍵字：安寧護理、新進護理人員、能力導向教學、可信賴專業活動

。

英文摘要：

Background:

Competency-based education has increasingly replaced knowledge-based teaching models in health professions education. A critical challenge lies in translating curricular competencies into observable and trusted performance in real clinical settings. Entrustable Professional Activities (EPAs) provide a practical framework for operationalizing professional competence by defining essential clinical tasks that learners can progressively perform with decreasing supervision. However, EPAs specific to adult hospice and palliative care nursing, particularly for newly employed nurses, remain underdeveloped.

Purpose:

This study aimed to develop a set of core Entrustable Professional Activities for newly employed nurses in adult hospice and palliative care (Hospice–Palliative Care EPAs, H-P-C EPAs), including key domains and specific EPA items.

Methods:

A descriptive study design was employed using a two-phase developmental approach. In Phase I, a systematic literature review was conducted to examine the current implementation and outcomes of EPAs in hospice and palliative care education and to generate a preliminary EPA framework. In Phase II, a Delphi technique was applied involving seven experts with expertise in hospice and palliative nursing, clinical practice, nursing education, and EPA development. Multiple iterative rounds were conducted to achieve expert consensus on the essential EPA domains and items for newly employed nurses in adult hospice and palliative care.

Results:

The systematic literature review identified 20 core articles, which informed the initial formulation of H-P-C EPA domains, definitions, and sub-items. In the first Delphi round, 60 candidate indicators were generated. Items with a median score ≥ 4 and an interquartile range < 0.6 were considered important and highly consistent and were retained for subsequent Delphi rounds. After four Delphi rounds, consensus was achieved on a final framework comprising 8 competency domains, 23 subdomains, and 44 core EPAs for adult hospice and palliative care nursing.

Conclusions:

This study establishes a structured and consensus-based EPA framework tailored for newly employed nurses in adult hospice and palliative care. The findings provide a foundation for integrating EPAs into nursing education and clinical orientation programs. Future research should focus on validating assessment tools, such as EQual rubric items, and on developing comprehensive EPA-based evaluation instruments to support both educational and clinical implementation.

Key words: Hospice Palliative Care, Newly Recruited Nurses, Competency-based medical education Entrusted Professional Activities

嬰兒粗大肢體動作活動設計之行動研究

周佩諭

中文摘要：

本研究採行動研究法，探討不同月齡嬰兒粗大肢體動作活動之設計歷程，旨在釐清相關文獻與政策資料於托育實務中的具體運用方式。研究初期，研究者蒐集國內托育活動之政府公開資料與相關文獻，整理嬰兒粗大肢體動作發展重點，據以形成活動設計初稿架構。其後，透過專家座談與討論，針對活動方案之發展適切性、結構安排及托育人員引導角色進行修正，以強化方案之專業完整性。

為確認活動方案於托育現場之可行性，本研究進一步採匿名方式蒐集托育人員之意見回饋，並綜合專家與托育人員建議，對活動內容進行多次調整與修正。研究結果顯示，經修正後之活動方案由原先偏重動作項目之設計，逐步轉為以嬰兒發展階段為核心之結構，並清楚呈現各階段之活動重點與引導原則，有助於提升托育人員對活動設計的理解與應用。

整體而言，本研究透過行動研究歷程，建構一套具發展依據且符合托育實務需求之嬰兒粗大肢體動作活動方案。研究成果可作為托育人員進行相關活動設計之參考資源，亦提供行動研究應用於托育實務之具體案例。

關鍵字：嬰兒粗大肢體動作活動、行動研究、活動設計、托育人員。

英文摘要：

This study employed an action research approach to examine the design of gross motor activity programs for infants at different developmental stages, with the aim of clarifying how existing literature and policy-related materials can be translated into childcare practice. In the initial stage, governmental childcare documents and relevant literature on infant gross motor development were analyzed to identify key developmental considerations and to construct a preliminary activity design framework. This initial framework was subsequently refined through expert consultation, focusing on developmental appropriateness, structural coherence, and the caregiving role in activity implementation.

To examine the practical feasibility of the proposed program, anonymous feedback was collected from childcare providers and integrated with expert suggestions for further revision. The results indicate that the activity program evolved from an initial focus on discrete motor skills to a developmentally sequenced framework that clearly delineates activity priorities and caregiver guidance across infant age groups. This revision process contributed to a clearer and more applicable structure for use in childcare settings.

Overall, through an iterative action research process, this study developed an infant gross motor activity program that is grounded in developmental principles and responsive to childcare practice. The finalized program may serve as a practical reference for childcare providers when designing gross motor activities for infants and offers an applied example of action research in the childcare context.

Key words: physical activities of infants, action research, activity design, caregivers

中文摘要：

在氣候變遷、資源耗竭與永續轉型壓力日益加劇的全球脈絡下，餐飲產業因高度連結食物系統、能源使用與消費行為，被視為永續發展的重要實踐場域。然而，現有永續素養相關量表多以一般高等教育學生為對象，較少回應餐飲管理專業之實務情境與職能需求，亦缺乏可作為課程設計與學習評量依據的具體指標體系。

本研究旨在建構一套適用於大專餐飲管理科系學生之永續素養指標體系，作為後續量表發展與課程評量之基礎。研究首先透過系統性文獻分析，整合永續發展、教育永續發展 (Education for Sustainable Development, ESD)、永續素養與餐飲教育相關研究，初步建構包含「永續知識」、「態度與價值」、「實作技能」、「行為意向與行動策略」及「職場應用與專業實踐」五大構面之指標題庫。接續邀請產、官、學界具餐飲與永續相關專長之專家，採用模糊德菲法 (Fuzzy Delphi Method, FDM) 進行兩回合問卷調查，以灰關聯值與共識收斂原則篩選指標。

研究結果顯示，經分層收斂與專家共識檢驗後，最終形成涵蓋五大構面之正式永續素養指標體系，並保留部分具代表性但共識尚未完全收斂之候選指標，以確保構面內涵之完整性與專業情境適切性。整體而言，所建構之指標體系兼顧理論基礎與餐飲專業實務特性，可作為大專餐飲教育中永續課程設計、教學評量與後續量表編製之重要依據，亦有助於深化學生由「理解永續」走向「實踐永續」的學習歷程。

關鍵字：永續素養；教育永續發展；模糊德菲法；指標建構。

英文摘要：

In the context of increasing global challenges such as climate change, resource depletion, and sustainability transitions, the hospitality and food service industry has been recognized as a critical sector for advancing sustainable development due to its close connections with food systems, energy use, and consumption practices. However, existing sustainability literacy instruments have largely been developed for general higher education populations and often fail to adequately capture the professional contexts and competency requirements of hospitality and culinary management education.

The purpose of this study was to construct a sustainability literacy indicator system specifically tailored to students in hospitality and culinary management programs at the tertiary level. Drawing on a systematic literature review of sustainability, education for sustainable development (ESD), sustainability literacy, and hospitality education, an initial pool of indicators was developed across five dimensions: sustainability knowledge; attitudes and values; practical skills; behavioral intentions and action strategies; and professional application and workplace practice. A panel of experts from academia, industry, and government sectors was then invited to participate in a two-round Fuzzy Delphi Method (FDM) process to evaluate the importance and consensus of the proposed indicators.

The results indicate that, through a layered convergence strategy based on grey importance values and consensus criteria, a finalized set of core sustainability literacy indicators was established across the five dimensions. In addition, several representative indicators that did not fully reach consensus were retained as candidate indicators to preserve conceptual completeness and contextual relevance. Overall, the proposed indicator system integrates theoretical foundations with the practical characteristics of hospitality education and provides a robust framework for curriculum design, learning assessment, and subsequent scale development. The findings contribute to bridging the gap between sustainability awareness and professional practice, supporting the cultivation of sustainability-oriented competencies among future hospitality professionals.

Key words: Sustainability literacy; Education for sustainable development; Fuzzy Delphi method; Indicator development

中文摘要：

鑒於人口老化加劇和肌肉病變罹患率增加，肌肉減少症已成為全球重大健康挑戰。肌肉減少症的臨床特徵是進行性骨骼肌萎縮，可能伴隨脂肪浸潤、纖維化或再生能力受損。肌少症的現有治療工具療效有限，預防適應不良的肌肉再生與發炎驅動的肌肉退化仍是亟待解決的關鍵課題，開發新型治療工具仍屬必要策略。epsilon-viniferin (ϵ -Viniferin) 具有抗發炎和鎮痛等作用，也是一種肌肉相關疾病的潛在生物活性化合物，受到越來越多的關注。本研究利用 C2C12 成肌細胞和肌管模型，系統性研究其對骨骼肌細胞活力、遷移、細胞因子調節、肌管形成及發炎誘導肌肉萎縮等作用。CCK-8 檢測結果顯示，濃度低於 625 nM 時無細胞毒性。划痕實驗結果顯示，300 nM 和 600 nM 之處理顯著加速 C2C12 成肌細胞的傷口癒合，顯示其可增強細胞遷移和再生能力。利用多點划痕損傷模型結合細胞激素陣列分析，發現其可提高細胞外 IL-1 β 、IL-3、IL-4、IL-6、IL-9、IL-10、IL-13、Eotaxin、IFN- γ 、KC、MIP-1 α 、RANTES 和 TNF- α 濃度，同時也提高細胞內 IL-9、Eotaxin、Eotaxin 及 MIP-1 α 的含量，顯示其可能具有多效性、多靶點的抗發炎或免疫調節作用。為進一步探討其在肌肉萎縮中的作用，我們利用 TNF- α 誘導發炎性肌管萎縮模型，發現濃度高達 600 nM 之 ϵ -viniferin 未導致成肌細胞或分化肌管的形態學毒性；值得注意的是，300~600 nM 可顯著增加肌管直徑，呈現其可能對肌管生長和成熟之促進作用。 ϵ -viniferin 可選擇性增強 TNF- α 刺激肌管中 LC3-II 蛋白的表達，而不影響 LC3-I 濃度，提示活化自噬可能是其潛在的抗萎縮機制。綜上所述， ϵ -viniferin 在骨骼肌細胞中能具有良好的抗發炎、促進再生和抗萎縮作用，呈現其作為新型候選活性成分在預防和治療肌少症的潛力。未來仍持續且深入研究，以闡明其分子訊號路徑和利用動物試驗驗證療效與治療意義。

關鍵字：肌少症(Sarcopenia)、小鼠成肌細胞、epsilon-葡萄素、腫瘤壞死因子- α 、自噬。

英文摘要：

Given the accelerated population aging and the increasing prevalence of muscle-related disorders, sarcopenia has emerged as a major global health challenge. Clinically, sarcopenia is characterized by progressive skeletal muscle atrophy, often accompanied by fatty infiltration, fibrosis, or impaired regenerative capacity. Current therapeutic options for sarcopenia remain limited in efficacy, and preventing maladaptive muscle regeneration and inflammation-driven muscle degeneration continues to represent a critical unmet need, underscoring the necessity for the development of novel therapeutic strategies. Epsilon-viniferin (ϵ -viniferin), a resveratrol dimer with documented anti-inflammatory and analgesic properties, has attracted increasing attention as a potential bioactive compound for muscle-related diseases. In this study, we systematically investigated the effects of ϵ -viniferin on skeletal muscle cell viability, migration, cytokine modulation, myotube formation, and inflammation-induced muscle atrophy using C2C12 myoblast and myotube models. CCK-8 assay results demonstrated that ϵ -viniferin exhibited no cytotoxicity at concentrations below 625 nM. Scratch wound-healing assays revealed that treatment with ϵ -viniferin at 300 and 600 nM significantly accelerated wound closure in C2C12 myoblasts, indicating enhanced cell migration and regenerative capacity. Using a multi-point scratch injury model combined with cytokine array analysis, ϵ -viniferin was found to increase extracellular levels of IL-1 β , IL-3, IL-4, IL-6, IL-9, IL-10, IL-13, Eotaxin, IFN- γ , KC, MIP-1 α , RANTES, and TNF- α , while also elevating intracellular levels of IL-9, Eotaxin, and MIP-1 α , may suggesting pleiotropic and multi-targeted anti-inflammatory or immunomodulatory effects. To further elucidate its role in muscle atrophy, a TNF- α -induced inflammatory myotube atrophy model was employed. ϵ -Viniferin at concentrations up to 600 nM did not induce morphological toxicity in either myoblasts or differentiated myotubes; notably, treatment with 300–600 nM ϵ -viniferin significantly increased myotube diameter, indicating a promotive effect on myotube growth and maturation. Mechanistically, ϵ -viniferin selectively enhanced LC3-II protein expression in TNF- α -stimulated myotubes without affecting LC3-I levels, suggesting that autophagy activation may represent a potential anti-atrophic mechanism. Collectively, these findings demonstrate that ϵ -viniferin exerts anti-inflammatory, pro-regenerative, and anti-atrophic effects in skeletal muscle cells, highlighting its potential as a novel bioactive candidate for the prevention and treatment of sarcopenia. Further in-depth studies are warranted to elucidate its molecular signaling pathways and in vivo therapeutic relevance.

Key words: Sarcopenia, C2C12 Mouse Myoblast Cell Line, epsilon-Viniferin, TNF- α , Autophagy

中文摘要：

本計畫為應用研究，以台灣培育山葵植物從品種培育後之葉梗廢棄物再利用，開發新穎化妝品之應用研究。本計畫未來可以提升原住民栽種山葵之應用並增加原住民回鄉工作之意願。

本計畫針對阿里山山葵 (*Wasabia japonica*) 葉根萃取物的生物活性及其在化妝品中的應用潛力進行深入研究。隨著天然草本萃取物在全球化妝品市場中的需求日益增長，台灣在地種植的草本植物逐漸成為新式化妝品原料開發的主流趨勢。本研究與阿里山地區的原住民部落緊密合作，以其特產阿里山山葵作為研究對象，旨在探索其葉根萃取物的各項生物活性並開發新穎化妝品。首先，本研究將利用超音波萃取技術進行有效成分的提取，並結合層析質譜法進行成分的純化及鑑定，以確立活性成分的分子結構與生物作用機制。山葵中含有多種主要的活性化合物種類，其中最重要的是氧化還原酶，異氰酸酯和芥子油苷，氧化還原酶具有許多效果，其中包括表現出與強大的抗氧化劑的超氧化物歧化酶(SOD)相關的相同特性。

因此本計畫也針對山葵萃取物之生物活性進行功能評估包含: (1)美白活性-酪氨酸活性抑制 (2)抗氧化活性: DPPH 自由基清除能力測定、總酚含量測定、金屬離子螯合能力測定。(3)安全性評估-細胞存活率測試。

此外，本計畫將自行製備山葵萃取物之乳液，進行其安定性與有效性測試。預期研究結果將揭示山葵葉根萃取物在化妝品應用中的多功能潛力，為台灣本土草本植物利用及天然原料化妝品的開發提供科學依據。

此外，研究將自行製備以山葵萃取物為基礎的乳液配方，並對其進行安定性測試，以確保產品在不同環境下的穩定性。隨後，將進一步進行乳液的功能性測試，特別是針對其美白效果的評估。預期本研究將可顯示阿里山山葵葉根萃取物在化妝品應用中的多重功能，證明其在美白、抗發炎產品中的應用潛力。最終，本計畫將為台灣本土草本植物的利用及天然原料化妝品的開發提供科學依據，並促進本地產業與原住民部落的合作，帶動地方經濟發展。

關鍵字：山葵萃取液、台灣原生種、化妝品有效性分析、美白、抗氧化。

英文摘要：

This project is an applied research study focused on the reutilization of wasabi (*Wasabia japonica*) leaf and stem waste, sourced from cultivated varieties in Taiwan, for the development of novel cosmetic applications. It aims to enhance the utilization of wasabi grown by indigenous communities and increase their willingness to return to their hometowns for employment.

The project specifically investigates the bioactivity and potential cosmetic applications of extracts from the leaves and roots of Alishan wasabi. With the growing global demand for natural herbal extracts in the cosmetics market, Taiwanese-grown herbs are increasingly becoming a mainstream trend in the development of new cosmetic ingredients. This research collaborates closely with indigenous tribes in the Alishan region, using Alishan wasabi as the research subject. The objective is to explore the bioactive properties of its leaf and root extracts and develop innovative cosmetic products.

First, the study will use ultrasonic extraction techniques to efficiently extract active ingredients, followed by purification and identification using chromatographic and mass spectrometry methods to determine the molecular structure and biological mechanisms of the active compounds. Wasabi contains several key bioactive compounds, the most important of which include oxidoreductase, isothiocyanates, and glucosinolates. Among these, oxidoreductase exhibits properties similar to superoxide dismutase (SOD), a powerful antioxidant enzyme.

Therefore, the project will assess the bioactivity of wasabi extracts through the following functional evaluations: (1) Whitening activity by inhibiting tyrosinase activity, (2) Antioxidant activity measured by DPPH free radical scavenging, total phenolic content, and metal ion chelating ability, and (3) Safety assessment through cell viability assays.

Additionally, the project will formulate an emulsion containing wasabi extract to conduct stability and efficacy tests. The expected results will reveal the multifunctional potential of wasabi leaf and root extracts in cosmetic applications, providing scientific evidence for the utilization of Taiwanese native herbs and the development of natural ingredient-based cosmetics.

Furthermore, the study will prepare wasabi extract-based emulsion formulations and perform stability tests to ensure the product's consistency under various environmental conditions.

Functional testing of the emulsion, particularly focusing on its whitening effects, will follow. It is anticipated that this research will demonstrate the multifunctional cosmetic potential of Alishan wasabi leaf and root extracts, confirming their utility in whitening and anti-inflammatory products. Ultimately, this project will provide a scientific foundation for the use of Taiwanese herbal plants in cosmetic development, promote collaboration between local industries and indigenous communities, and stimulate local economic growth.

Key words: Wasabi extract, Taiwanese native species, efficacy analysis of cosmetics, whitening, antioxidant.

中文摘要：

Granisetron hydrochloride 是一種 5-HT₃ 受體拮抗劑，它能有效預防和控制由癌症化療和放射治療引起的急性及延遲性嘔吐，在成人和兒童術後噁心嘔吐管理中有效且耐受性良好。本研究混合不同比例蜂蠟與椰子油搭配乳化劑聚甘油聚蓖麻油酸酯，利用 3D 列印製作的矽膠微流體晶片搭配加熱/冷卻二段式的系統溫控製備蠟質滴丸。結果顯示，控制蜂蠟與椰子油的含量/比例，可以調整出適合微流體操作所需的物性，也有助於形成低結晶性脂質結構，利於後續包覆具功能性活性成分的應用。在本研究開發的溫控矽膠流聚焦微流體系統中，側流水相 (流量 4.00 mL/min) 夾擊中央油相 (流量 0.05 mL/min) 能製成平均粒徑 452 nm 的奈米尺度蠟質滴丸。不同於傳統尺寸介於 2-4 mm 的脂質滴丸，奈米級顆粒不易引起感官不適，且具備高表面積與體積比，特別適合應用於在環境溫度變化下快速溶解與釋放的情境。

關鍵字：滴丸，微流體，Granisetron hydrochloride。

英文摘要：

Granisetron hydrochloride is a 5-HT₃ receptor antagonist that effectively prevents and controls acute and delayed vomiting caused by cancer chemotherapy and radiation therapy. It is well-tolerated and effective in managing postoperative nausea and vomiting in both adults and children. In this study, beeswax and coconut oil were blended at varying ratios and formulated with the emulsifier polyglyceryl polyricinoleate (PGPR). Wax-based lipid droplets were prepared using a 3D-printed silicone microfluidic chip integrated with a two-stage heating/cooling temperature-control system. The results demonstrate that precise control of the beeswax-to-coconut oil ratio enables tuning of physicochemical properties suitable for microfluidic processing, while promoting the formation of low-crystallinity lipid matrices. Within the temperature-controlled silicone flow-focusing microfluidic system developed in this work, an aqueous side-stream phase (flow rate: 4.00 mL/min) shearing a central oil phase (flow rate: 0.05 mL/min) yielded nanoscale wax-based lipid droplets with a mean particle size of 452 nm. In contrast to conventional lipid pellets with diameters of 2–4 mm, these nanoscale carriers minimize sensory irritation and provide a high surface-area-to-volume ratio, facilitating enhanced dissolution kinetics and more efficient drug release. This feature is particularly advantageous for delivery systems requiring rapid and responsive release under variable temperature conditions.

Key words: dripping pills , Microfluidic , Granisetron hydrochloride

中文摘要：

殯葬管理條例（Mortuary Service Administration Act）自 2002 年 7 月公布後，明定殯葬事業的相關規範及措施，為殯葬服務管理最主要之依循。殯葬管理關乎死亡尊嚴與社會傳承、社會秩序，合法妥善的管理制度除能保障民眾基本權益，亦為維護公共利益的重要措施。本研究對涉殯葬管理條例者之司法裁判案件類型與原因進行探究，研究期間與研究方式係由司法裁判書中蒐集及分析 2011 年至 2024 年間由高等法院司法判決書結果進行分析，由明確的裁判結果分析案件涉及的殯葬管理條例之條款、民刑事判決類型，瞭解違法受裁之案例、相應的判決結果，分析常見的殯葬服務、管理..等違法情狀。

本研究顯示，殯葬管理制度落實推動的重要性，司法涉案類型反映實務推動問題與困境，刑事案件之財經或行政不法行為，突顯公權力介入或資源分配過程中，廉政與透明度仍需加強。民事糾紛以財產權爭議為主，反映殯葬服務市場化過程中，民眾與業者、法人間對使用權、服務費、場地等常有權利義務爭執。除常見財產與契約爭議外，亦有涉及「協力處理殯葬」、「永久使用塔位」、「信託撤銷」、「通行權確認」等特殊案由，顯示殯葬事務已深植日常民事法律行為中，牽涉層面廣泛。

研究建議：(1)增設殯葬業服務契約監理機制：針對常見契約爭議，建立監督或認證制度，以提升服務品質並降低訴訟發生率。(2)建立司法與行政橫向聯繫機制：強化司法判決對行政機關政策與查核的回饋功能，提升整體殯葬管理效能。(3)推動殯葬數位治理與透明化：強化資訊公開與電子化管理，降低不透明操作風險，有助預防貪瀆與詐欺情事。(4)鼓勵學術與實務對話：持續蒐集相關判決案例，鼓勵法律界、殯葬業界與學界對話，作為日後殯葬管理條例及相關法規修正及政策制定之參酌。

關鍵字：司法裁決、殯葬管理、殯葬管理條例。

英文摘要：

Since its enactment in July 2002, the Mortuary Service Administration Act has clearly stipulated the regulatory framework and administrative measures governing the mortuary service industry, serving as the principal legal basis for the management of funeral and burial services. Mortuary administration involves not only the dignity of death but also cultural continuity and social order. A lawful and properly implemented regulatory system not only safeguards the fundamental rights of the public but also constitutes an essential mechanism for the protection of public interests.

This study explores judicial cases involving violations of the Mortuary Service Administration Act by examining the types and underlying causes of litigation. Judicial decisions rendered by the Taiwan High Court between 2011 and 2024 were collected and systematically analyzed. Based on final judicial rulings, this study identifies the specific provisions of the Act implicated in each case, distinguishes between civil and criminal judgment categories, and examines the nature of legal violations and corresponding judicial outcomes. Furthermore, it analyzes recurring patterns of unlawful practices related to mortuary services and management.

The findings highlight the critical importance of effective implementation of the mortuary management system. The distribution of judicial case types reflects practical challenges and institutional constraints in policy enforcement. Criminal cases involving financial misconduct or administrative illegality reveal persistent deficiencies in integrity and transparency in the exercise of public authority and the allocation of public resources. Civil disputes are predominantly centered on property rights, reflecting frequent conflicts among individuals, service providers, and legal entities over usage rights, service fees, and facilities in the context of the marketization of mortuary services. In addition to common property and contractual disputes, cases involving cooperative funeral arrangements, perpetual columbarium usage rights, trust revocation, and the confirmation of rights of access further demonstrate that mortuary affairs have become deeply embedded in everyday civil legal relations and encompass a broad range of legal dimensions.

Based on these findings, this study offers the following recommendations:

- (1) establishing regulatory and supervisory mechanisms for mortuary service contracts to address common contractual disputes, enhance service quality, and reduce litigation;
- (2) developing horizontal coordination mechanisms between judicial and administrative authorities to strengthen policy feedback, regulatory oversight, and overall enforcement effectiveness;
- (3) promoting digital governance and transparency in mortuary administration through enhanced information disclosure and electronic management, thereby reducing the risks of opaque practices, corruption, and fraud; and

(4) encouraging sustained dialogue among legal professionals, mortuary service practitioners, and scholars through the continuous collection and analysis of judicial cases, to inform future amendments to the Mortuary Service Administration Act and related regulatory reforms and policy development.

Key words: Judicial rulings, Mortuary service management,
Mortuary Service Administration Act

中文摘要：

研究背景與目的：情感學習是護理教育中培養同理心與臨床溝通技巧的核心。隨科技進步，沉浸式學習策略逐漸受到重視。本研究旨在探討「機器人劇場」作為一種創新的沉浸式教學方法，對護理科學生情感學習成效之影響，並以社會情緒學習(SEL)為理論架構，評估其在緩解實習焦慮及提升情緒調節能力上的具體表現。

研究方法：本研究採用準實驗設計，以北台灣某護理專科學生為研究對象，共納入 114 位學生（實驗組 47 人，接受機器人劇場介入；對照組 67 人，提供紙本手冊）。測量工具包含：醫院焦慮分量表、情感表達困難簡式量表、情感調節問卷及簡明復原力量。研究採用共變數分析（ANCOVA）進行統計處理，以檢驗排除背景變項干擾後的介入淨效果。

研究結果：研究發現，在控制背景變項後：(1) 實習焦慮呈現顯著改善，實驗組調整後平均數顯著低於對照組，顯示機器人劇場能提供心理安全感，緩解臨床預期焦慮。(2) 情感表達困難與表達抑制呈現顯著上升，反映出沉浸式劇場成功啟動了學生的情緒覺察，使其從「無意識無能」進入意識到自身表達限制的「有意識無能」階段，並在壓力情境下產生初步的防禦性抑制策略。(3) 認知重評與復原力則未達統計顯著差異，顯示深層認知架構之轉變需更長期的介入。

結論與建議：本研究證實機器人劇場能有效降低學生的實習焦慮，並啟動情感覺察歷程。研究建議未來教學應在劇場介入後增加結構化的引導討論，協助學生將覺察到的情緒壓力轉化為高階的認知調節策略，以深化 SEL 框架下之情感學習成效。

關鍵字：機器人劇場、護理教育、社會情緒學習、實習焦慮、沉浸式學習。

英文摘要：

Background and Purpose: Emotional learning is a critical component of nursing education for cultivating empathy and clinical communication skills. With advancements in technology, immersive learning strategies have gained increasing attention. This study explored the impact of "Robot Theater"—an innovative immersive pedagogical approach—on the emotional learning outcomes of nursing students. Guided by the Social Emotional Learning (SEL) framework, this study evaluated the effectiveness of robot theater in reducing internship anxiety and enhancing emotional regulation competencies.

Methods: A quasi-experimental design was employed. Participants were recruited from a nursing junior college in Northern Taiwan, resulting in 114 valid subjects (Experimental Group, $n = 47$, received the Robot Theater intervention; Control Group, $n = 67$, received handbook intervention). Measurement tools included the Hospital Anxiety and Depression Scale (HADS-A), the Perth Alexithymia Questionnaire-Short Form (PAQ-S), the Emotion Regulation Questionnaire-Short Form (ERQ-S), and the Brief Resilience Scale (BRS). Analysis of Covariance (ANCOVA) was utilized to examine the net effect of the intervention by controlling for these confounding variables.

Results: After controlling for background variables, the results indicated: (1) Internship anxiety showed significant improvement, with the adjusted mean of the experimental group being significantly lower than that of the control group, suggesting that Robot Theater provides psychological safety and alleviates anticipatory clinical anxiety. (2) Emotional difficulty and expressive suppression scores increased significantly. This reflects that the immersive theater successfully activated students' emotional awareness, transitioning them from a stage of "unconscious incompetence" to "conscious incompetence" regarding their emotional expression limits, while also triggering preliminary defensive suppression strategies under pressure. (3) No significant differences were found in cognitive reappraisal or resilience, indicating that shifts in deep-seated cognitive architectures require more long-term intervention.

Conclusion and Recommendations: This study confirms that Robot Theater effectively reduces internship anxiety and initiates the emotional awareness process in nursing students. It is recommended that future pedagogical designs incorporate structured debriefing sessions following the theater intervention. Such sessions would assist students in transforming identified emotional stressors into high-level cognitive reappraisal strategies, thereby deepening emotional learning outcomes within the SEL framework.

Key words: Robot Theater, Nursing Education, Social Emotional Learning (SEL), Internship Anxiety, Immersive Learning

中文摘要：

臺灣省運動會自 1946 年起到 1973 年共計舉行 28 屆，後來由於 1970 年代初期臺灣的國際地位變化，加上省級行政體系逐漸被弱化，1974 年更名為臺灣區運動會。臺灣省運動會舉辦 28 年間，是臺灣體育發展重要的一個時期，參賽選手的背景與臺灣運動文化的變遷，從這 28 屆比賽中，可窺探出些許端倪。

軟式網球運動，從 1943 年開始舉辦後，就是臺灣省運動會重要的比賽項目，女子組的賽事，也是從 1943 年開辦以來，每屆都會舉辦，不曾間斷。

研究者長期從事戰後台灣女性從事軟式網球運動的研究工作，發現有許多女子軟式網球選手，在臺灣省運動會，除了參加軟式網球運動競賽之外，也報名參加其他比賽，這個現象引起研究的好奇，擬藉由本研究計畫，一窺臺灣省運動會舉辦期間，女性軟式網球運動員，參加他競賽項目的情形與運動表現，從中梳理出這一個有趣的歷史現象。

本研究以歷史研究法以及訪談法，去分析戰後臺灣省運動會女子軟式網球選手，跨項目參加其他運動項目比賽的情形，藉由耆老的口述，以及文獻分析的方法，重現戰後臺灣省運動會女子軟式網球選手跨項目參加比賽的時代樣貌。就某種意義而言，通過本篇論文的學術研究探討，除了可瞭解戰後到 1973 年將近 30 年間，台灣女子軟式網球選手參與軟式網球運動發展的過程，也可透過這個過程，反應出此一時期女性從事軟式網球者在當時社會的處境，並試圖還原當時的歷史影像，這是本研究的主要動機與目的。

研究結果得知：臺灣省運動會從 1953 年開始舉辦軟式網球比賽，然而，1946 年第一屆臺灣省運動會就有網球比賽項目。1946 年到 1952 年間參加臺灣省運動會網球賽的女子選手，有許多是平日從事軟式網球運動，僅在臺灣省運動會比賽前才改打網球。其二：1947 年到 1953 年之間，嘉義縣、台中市、新竹市參加臺灣省運動會的女子選手，是由嘉義女中、台中女中、新竹女中的學生代表參賽，這些女選手有部分選手同時參加排球、籃球、壘球等項目，參加網球比賽則屬於玩票性質。其三：部分女子軟式網球選手，在從事軟式網球運動之前，曾是田徑、壘球選手，後來從事軟式網球運動後，表現優異入選各縣市的軟式網球代表隊，參加臺灣省運動會女子軟式網球賽。

關鍵字：軟式網球、臺灣省運動會、跨項目參賽。

英文摘要：

The Taiwan Provincial Games were held 28 times from 1946 to 1973. Due to changes in Taiwan's international status in the early 1970s and the gradual weakening of the provincial administrative system, the event was renamed the Taiwan Regional Games in 1974. The 28 years of the Taiwan Provincial Games represented an important period in the development of sports in Taiwan. The backgrounds of the participating athletes and the evolution of Taiwan's sports culture during this period can be glimpsed through these 28 editions of the Games.

Soft tennis has been an important event in the Taiwan Provincial Games since it was introduced in 1943. The women's division has been held continuously since its inception in 1943 without interruption.

The researcher, having long studied the participation of Taiwanese women in soft tennis after World War II, discovered that many female soft tennis athletes also participated in other competitions during the Taiwan Provincial Games. This phenomenon sparked academic curiosity. This research project aims to explore the extent and performance of female soft tennis athletes participating in other sports events during the Taiwan Provincial Games, and to outline this intriguing historical phenomenon.

This study employs historical research methods and interviews to analyze the cases of female soft tennis athletes who participated in multiple sports at the Taiwan Provincial Games after World War II. By collecting oral histories from senior athletes and analyzing historical documents, the study aims to reconstruct the participation of these women in multiple events and to illustrate the era in which this occurred. In a broader sense, this academic exploration provides insights into the nearly 30 years from the postwar period to 1973, revealing not only the development of women's involvement in soft tennis but also reflecting the social conditions of women athletes at the time. The study seeks to reconstruct the historical image of this period, which constitutes the primary motivation and purpose of this research.

The research findings indicate: (1) Soft tennis competitions officially began in the Taiwan Provincial Games in 1953. However, tennis events were already part of the first Games in 1946. Between 1946 and 1952, many female athletes who usually played soft tennis switched to playing tennis specifically for the Provincial Games. (2) From 1947 to 1953, female participants from Chiayi County, Taichung City, and Hsinchu City were mainly students from Chiayi Girls' High School, Taichung Girls' High School, and Hsinchu Girls' High School. Some of these athletes also participated in volleyball, basketball, and softball, and their participation in tennis was more casual or experimental in nature. (3) Some female soft tennis players had backgrounds in athletics or softball before switching to soft tennis. After transitioning, their outstanding performance led to their selection to represent their respective counties and cities in the women's soft tennis

competitions at the Taiwan Provincial Games.

Key words: soft tennis, Taiwan Provincial Games, multi-event participation

史記人物敘事研究

劉錦源

中文摘要：

《史記》是一部深具價值的傳統經典，如他寫狂飆英雄—項羽、「卡里斯馬 (charisma)」領導者--劉邦、天才將領—李廣等，無不引人入勝。本研究計畫即希望透過對《史記》人物敘事的研究，使《史記》獲得再深耕的機會，並進一步希望能開拓《史記》研究的光明坦途。再者，《史記》敘述最精彩的部分為高祖時期和武帝時期。因此，本計畫在挑選史記人物敘事研究的準據方面，即擬以高祖時期和武帝時期為核心，環繞著這二大核心時期，初期擬先挑選：1.對時代有重大影響者。2.性格鮮明者。3.事蹟較特殊者。4.在歷史上被討論較多者。5.較有趣味者。以這五大準據為基礎，擬分別挑選出司馬遷、嬴政、項羽、劉邦、張良、蕭何、韓信、陳平、李廣、衛青、霍去病、竇嬰、田蚡、游俠、酷吏、劉徹等人物作為研究的對象，並旁及同時期的相關人物。本研究計畫企圖透過對一個個具代表性的人物故事的整合，以明太史公「究天人之際」、「通古今之變」、「成一家之言」之意涵。

關鍵字：史記、史記人物、敘事研究。

英文摘要：

(三) "Shiji" is a valuable traditional classic. For example, it writes about the furious hero Xiang Yu, the leader of "charisma" Liu Bang, and the genius general Li Guang, etc., which are all fascinating. This research project hopes that through the study of the character narratives in "Shiji", "Shiji" will gain opportunities for in-depth study, and further open up a bright and smooth path for the study of "Shiji". Furthermore, the most exciting parts of the narrative in "Shiji" are the period of Gaozu and Emperor Wu. Therefore, in terms of selecting the basis for narrative research on characters in Shiji, this project plans to focus on the Gaozu period and the Emperor Wu period, surrounding these two core periods. In the early stage, it is planned to select: 1. Those who have a significant influence on the era. 2. Or those with distinctive personalities. 3. Or those with more special deeds. 4. Or the one that has been discussed more in history. 5. Or more interesting. Based on these five criteria, it is planned to select Sima Qian, Ying Zheng, Xiang Yu, Liu Bang, Zhang Liang, Xiao He, Han Xin, Chen Ping, Li Guang, Wei Qing, Huo Qubing, Dou Ying, Tian Fu, You Xia, Ku Li, Liu Che. and other figures as the objects of research, as well as related figures of the same period. This research project attempts to explore the meaning of "studying the relationship between heaven and man", "understanding the changes in ancient and modern times", and "building a family" through the integration of representative character stories.

Key words: Shiji, characters in Shiji, narrative research