中文摘要

全球人口老化速度的急增更突顯日益嚴重的老人問題，隨著年齡增長而退化的身心機能為其中主要問題之一。因此本研究主要目標是建構一套長期照護服務資訊平台，協助高齡者取得完善照護服務，並建立長期老人健康檔案，達到提昇照護品質。

本研究開發的資訊平台是由四套系統構成，（1）老人健康綜合評量系統可在眾多老人中篩選出需協助的問題老人，並從中分析與規劃照護資源的運用方式。（2）長期照護管理系統主要用以整合照護服務資源，協助安排適合老人的服務資源。（3）失智評量系統主要是提供照護機構長期評估老人健康，用以即時掌握失智老人身心功能退化趨勢以規劃適當照護方式。（4）室內型與室外型 RFID 安全照護系統進行老人的安全監控，避免獨自離開機構或進入危險區域而發生走失或危及安全。

長期照護整合服務資訊平台已於國內某長期照護管理中心及日間照顧機構架設完成，並實際導入照護服務，其中室內型 RFID 安全照護系統更有多次防止機構受托老人走失的成功案例。而為了更清楚瞭解 RFID 安全照護系統的效能，本研究共設計兩項調查與五種實驗測試，（1）針對 RFID Tag 先後兩種設計的配戴意願是以機構 21 位個案為調查對象，分析顯示原先名片型 RFID Tag 有 80%的配戴意願，

而改版後的項鍊型 RFID Tag 更高達 95%，其中重量與大小對老人配戴意願度是最大的影響。（2）以 1 到 20 不同數量的 RFID Tag 對單一禁止區域測試室內型 RFID 安全照護效能，結果系統平均能在 4 秒左右啟動警示並顯示區域位置。(3)各以 1 到 15 不同數量的 RFID Tag 同時對兩個禁止區域測試室內型系統效能，發現系統警示平均能在 4 秒內啟動。（4）室外型 RFID 安全照護系統的 RFID 感測器偵測距離實驗發現半徑 6.7 公尺的範圍內是最佳的感測範圍。（5）由室外型 RFID 感測器與 Tag 配戴高度及異常辨識時間設定的實驗中知道，當異常辨識時間設定為 3 秒、感測器放置高度離地 120 公分（約腰部）以及 Tag 配戴高度離地 110 公分（側腰部）時，Tag 訊號能 100%被接收且誤判率最低。（6）室外型系統警示效能實驗是模擬個案離開感測範圍的警示啟動時間，實驗結果系統平均可在 6 秒內主動發出警示。(7)RFID 安全照護系統滿意度是對照護機構四位工作人員調查，結果顯示在輔助效益、穩定度、操作性以及 RFID Tag 等設計，有 75%（n = 3）的工作人員感到很滿意。

英文摘要

The rapid acceleration of population aging spotlights the increasing seriousness of problems facing the elderly. First and foremost among these is the deterioration of health and mental function that occurs as people age. The goal of this study is to construct a long-term care services information platform that provides a complete service of elder care and establishes a long-term patient health record to improve the quality of that care.

This information platform is composed of four systems. (1) Elderly Health Rating System – Assists in determining which elderly people require special care. It also aids in analyzing and planning the utilization of care resources. (2) Long-term Care System – Used to integrate care resources and arrange service resources suitable for the elderly. (3) Dementia Rating System – Provides caregiver organizations with long-term health assessments for their elderly patients, enabling them to plan suitable care for patients with dementia by tracking trends in their physical and mental deterioration. (4) Indoor and Outdoor RFID Safety Care System – Monitors the safety of the elderly, preventing them from leaving a facility unattended or entering hazardous areas.

This long-term care services information platform was already set up at a local long-term care center and a day care institution. It had become part of the care services provided at these facilities. There had already been several successful examples of the indoor RFID safety-care system preventing elderly patients from wandering out of the facilities and becoming lost. In order to more clearly understand the efficacy of RFID

Safety Care System, this study devised two surveys and five experiments to test the system. (1) We surveyed 21 patients regarding their willingness to wear each of the two forms of RFID tags. 80% of those surveyed were willing to wear the name card sized RFID Tag, while willingness rose to 95% for the necklace RFID tag. The size and weight of these tags are the most effective factors on their willingness to wear tags. (2) Various numbers of RFID tags, ranging from one to twenty, were taken into a single restricted area to test the effectiveness of the Indoor RFID Safety Care System. On average, the system displayed the tag location and raised an alert in 4 seconds. (3) When two restricted areas were present and one to fifteen tags in each area of the Indoor RFID Safety Care System were used, alerts were triggered in an average of 4 seconds. (4) The Outdoor RFID Safety Care System's ideal detection distance was within a 6.7m radius of the RFID Reader. (5) Through experimentation with the positions of outdoor RFID Reader and Tag, we discovered that 100% tag signal receipt is achieved when the Reader is positioned at 120 cm high (waist level), and the tag is worn at the side of the waist (110 cm high). With these settings, the erroneous detection rate is also at its lowest. (6) Outdoor RFID Safety Care System Alert Effectiveness – Through simulating a patient leaving the RFID monitoring range, we found that the system's alert was triggered within 6 seconds on average. (7) RFID Safety Care System Satisfaction Survey - Of the four care staffs surveyed, 75% (n=3) were very satisfied with the RFID system's benefits, stability, operation, and tag design.