Abstract Title: An Avatar-Guided Integrated Platform for Social and Cognitive Engagement in Older Adults: A Pilot Study

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Social isolation and cognitive decline represent significant risks to positive aging; yet, digital tools often address them separately. Evidence suggests that combining social engagement with cognitive strategy training produces superior cognitive outcomes compared to isolated activities. We developed AMI, an integrated application combining an LLM-based voice chatbot for dialogue generation module with a touch-screen cognitive games module, consisting of object categorization, utility-of-things reasoning, and LLM-verified verbal fluency tasks. A unified virtual avatar 'AMI' functions across both modules to build social-emotional relationships with users. Twelve cognitively healthy nursing home residents in China (M = 81.2 years, range = 74-88) used both AMI modules for 30 minutes and completed questionnaires. Evaluation via System Usability Scale (SUS) demonstrated high intention to use (M = 4.75/5, SD = 0.62) and operating confidence (M = 4.67/5, SD = 0.89). Scores from Senior Technology Acceptance Model (STAM-14) suggested strong control beliefs (M = 8.71/10, SD = 1.59) and positive attitudinal beliefs (M = 8.67/10, SD = 1.97). Quality of AI Social Interaction scores (AISI; M = 4.92/7, SD = 2.23) indicated favorable social interaction experiences, with the perception of 'AMI' as a friend (M = 5.6/7, SD = 2.46). Non-parametric tests for SUS and STAM-14 scores demonstrated consistent results across participants and the scores were significantly above chance levels (ps< .031; chance tests could not be run for AISI scores due to missing data). These findings suggest that an avatar-led platform integrating social and cognitive activities shows promise in supporting the well-being of older adults.

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