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探討思覺失調症患者獨立生活信心：患者自評與代理評估比較

Exploring Independent Living Confidence Among Individuals with Schizophrenia: Self- and Proxy Perspectives

藍千雅

Cian-Ya Lan

指導教授：李士捷 博士

Advisor: Shih-Chieh Lee, Ph.D.

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探討思覺失調症患者獨立生活信心：患者自評與代理評估比較

Exploring Independent Living Confidence Among Individuals with Schizophrenia: Self- and Proxy Perspectives

本論文係藍千雅（R12429018）於國立臺灣大學職能治療學系所完成之碩士學位論文，於民國114年6月3日經下列考試委員審查通過及口試及格，特此證明。

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致謝

這是我的第一篇論文，相信不會是最後一篇。

希望學術這條路上能永保初心，持續提醒不須厭惡自己。

謝謝士捷老師，謝謝同學，謝謝丈夫。

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中文摘要

背景與研究目的：獨立生活是思覺失調症患者復健的重要目標。然而，具有相同功能者未必抱有同等信心，顯示能力與信心為不同構念。此外，代理人常為個案無法自行作答時的資訊來源，但代理人的主觀感受多與個案本人不同，支持個案自陳與代理人回報的資訊應分別解讀。基於上述原因，儘管多篇研究曾探討獨立生活能力之相關因素，與個案及代理人獨立生活信心相關的因素仍大多未知，限制臨床介入之有效性。本研究旨在檢驗與思覺失調症者與代理人獨立生活信心相關的因素，以提供臨床介入之基礎。

研究方法：本次級資料分析使用臺灣身心障礙資料庫之數據。研究對象為思覺失調症患者，並排除擁有其他共病者，除大多數個案皆有失智症故未排除外。獨立生活信心以世界衛生組織身心障礙評估量表 2.0 (World Health Organization Disability Assessment Schedule 2.0) 之單題進行評估，相關因素則選自該量表的其他題項。本研究分別檢驗患者與代理人的回報資料，並採用多元逐步迴歸分析，以控制年齡與性別的影響。

研究結果：本研究分析來自 95 位患者與 108 位代理人的資料。在自陳評估組中，四項因素與獨立生活信心具顯著關聯，校正後之解釋力達 73%。這些相關的因素包括：長距離行走 (b = 0.84)、學習新事物 (b = 0.46)、參與社區活動 (b = 0.29)，以及長時間站立 (b = -0.39)。在代理人評估組中，共計八項因素與獨立生活信心相關，校正後之解釋力為 57%。關聯的因素包括：長時間站立 (b = 0.41）、交新朋友 (b = 0.63)、穿衣服 (b = 0.46）、記得重要事情 (b = 0.43)、理解言語 (b = -0.29)、專注十分鐘 (b = -0.43)、室內移動 (b = -0.22)，以及性活動 (b = -0.23)。

結論：本研究結果顯示四項與八項活動分別與病患及代理人對個案獨立生活信心程度有關。由於這些相關因素大多不重疊，臨床評估與介入應同時考量病患與代理人考慮之相關因素，以提升準確性與實用性。

關鍵字：獨立生活、思覺失調、自我評估信心、代理人評估信心

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Abstract

Background and Objectives: Independent living is a key goal in the rehabilitation of individuals with schizophrenia. However, similar levels of functioning do not necessarily correspond to similar levels of confidence, suggesting that confidence and ability are distinct constructs. In addition, proxies are often used as an alternative when the data cannot be directly obtained from patients, but proxies' perceptions are likely to differ from those of patients. Thus, the patient- and proxy-reported data should be assessed and interpreted separately. While previous studies have examined factors associated with ability in independent living, those with the confidence in independent living are largely unknown, which may constrain the effectiveness of clinical interventions. This study aimed to identify factors associated with self- and proxy-reported confidence in independent living among individuals with schizophrenia, offering evidence for clinical interventions.

Methods: Secondary data were extracted from the Taiwan Databank of Persons with Disabilities. Participants were patients or proxies of individuals diagnosed with schizophrenia. Those with comorbid conditions were excluded, except for dementia, as most participants had this condition. Confidence in independent living was assessed by an item of the World Health Organization Disability Assessment Schedule 2.0. Associated factors were selected from the remaining items of the same

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measure. Multiple regression analyses with forward selection were conducted separately for patient- and proxy-reported data to identify associated factors, controlling for age and sex.

Results: Data from 95 patients and 108 proxies were analyzed. The self-reported group's confidence in independent living was associated with four factors, accounting for 73% of the variance adjusted for the model complexity. The associations were observed for long-distance walking (b = 0.84), learning new tasks (b = 0.46), joining community activities (b = 0.29), and standing for long periods (b = -0.39). In contrast, the proxy-reported group's confidence was influenced by eight factors, explaining 57% of the variance. The associations included standing for long periods (b = 0.41), making new friends (b = 0.63), getting dressed (b = 0.46), remembering important things (b = 0.43), understanding speech (b = -0.29), concentrating for 10 minutes (b = -0.43), indoor movement (b = -0.22), and sexual activities (b = -0.23).

Conclusions: Our study identified four and eight factors associated with confidence in independent living from the patient- and proxy-reported models. Given that the associated factors are largely different across patient and proxy respondents, both perspectives should be incorporated in assessment and intervention planning.

Keywords: Independent living, schizophrenia, self-reported confidence, proxy-reported confidence

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Chapter 1. Introduction

1. 1 Brief Overview of Schizophrenia

1. 1. 1 Definition and Core Features of Schizophrenia

Schizophrenia is a mental disorder, which can significantly disrupt individuals' cognition (Dorofeikova et al., 2021), perception (Dong et al., 2019), and affect (Marosi et al., 2019). These deficits may lead to profound impairments in social, occupational, and overall functional capacities (Kumari et al., 2023). Given that the dysfunction does not improve automatically, individuals with schizophrenia are target populations of occupational therapy in mental health rehabilitation.

According to the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5) (American Psychiatric Association, 2013) , the diagnosis requires at least two characteristic symptoms, including delusions, hallucinations, disorganized speech, grossly disorganized or catatonic behavior, or negative symptoms. In addition, at least one must be delusions, hallucinations, or disorganized speech. Furthermore, the symptoms must persist for a considerable portion of a one-month period, with functional impairment lasting at least six months (Tandon, 2013).

Among the previously mentioned symptoms, delusions, hallucinations, and disorganized speech are known as positive symptoms, which represent an excess or distortion of normal function (Correll & Schooler, 2020). Briefly, delusions are fixed,

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false beliefs resistant to contradictory evidence, often classified based on their content, such as persecutory, grandiose, or referential themes (Baker et al., 2019). Hallucinations, often auditory, involve perceiving non-existent voices that may comment on actions or issue commands (Parnas et al., 2024). Disorganized speech, indicative of disorganized thinking, manifests as tangential, incoherent, or illogical speech patterns, impairing communication and social interactions (Tan et al., 2021). These positive symptoms, while disruptive, are episodic and frequently the initial focus of clinical intervention (Bighelli et al., 2018).

In contrast, diminished emotional expression, avolition, anhedonia, and alogia are known as negative symptoms, which reflect a reduction or absence of normal function and are closely associated with long-term disability (Correll & Schooler, 2020; Galderisi et al., 2018). Diminished emotional expression is characterized by flat affect, limited eye contact, and monotonic speech (Riehle et al., 2018). Avolition reflects a lack of motivation for goal-directed activities, reducing productivity in areas such as work, self-care, or leisure (Strauss et al., 2021). Anhedonia refers to a diminished capacity to experience pleasure (Liang et al., 2022). Alogia, reduced speech output, may further contribute to social withdrawal and isolation (Foussias & Remington, 2010). Unlike positive symptoms, these negative symptoms are more

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enduring and often present greater challenges to rehabilitation, as they undermine engagement with treatment and daily life activities (Correll & Schooler, 2020).

The interplay of positive and negative symptoms creates a complex clinical picture, with each domain contributing uniquely to functional impairments. While positive symptoms often dominate initial presentations and attract clinical attention (Bighelli et al., 2018), negative symptoms are more closely linked to chronic disability and reduced quality of life (Harvey et al., 2019; Kaneko, 2018). Accordingly, modern diagnostic frameworks emphasize functional impairment as a unifying criterion, reflecting a shift toward integrated approaches that prioritize holistic patient care and long-term recovery (Green, 2016; Lindenmayer, 2008).

1. 1. 2 Prevalence Overview

The prevalence of schizophrenia exhibits considerable variation globally, with a median lifetime morbid risk of 7.2 per 1,000 persons (McGrath et al., 2008), underscoring its significance as a widespread public health concern. In Taiwan, the prevalence is estimated to be between 0.34% and 0.64% (Chien et al., 2004), aligning closely with global rates and highlighting its impact as a significant public health issue. Given the prevalence and the burden on patients and caregivers, the World Health Organization (WHO) recognizes schizophrenia as a leading cause of disability

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across geographic, cultural, and socioeconomic boundaries (World Health Organization, 2021).

1. 2 Independent Living Among Individuals with Schizophrenia

1. 2. 1 Historical Background

The right of individuals with disabilities to live independently is a widely recognized global consensus (Lewis & Richardson, 2020). Independent living refers to an individual 's capacity to reside without external assistance or supervision, serving as a critical outcome measure in mental health rehabilitation (Budde & Bachelder, 1986; Revheim & Medalia, 2004; Woodill & Willi, 2006), rooted in the principles of deinstitutionalization (Oliver, 1992). Emerging in the mid-20th century, deinstitutionalization sought to shift care for individuals with mental health conditions from long-term institutional settings to community-based support systems (Yohanna, 2013). This movement was driven by a growing emphasis on human rights alongside advancements in both medical and non-medical treatments (Molony & Taplin, 1988; Yohanna, 2013). It underscored the inherent value of autonomy and self-determination for individuals with mental health conditions (Taylor Salisbury et al., 2017). By enabling them to live meaningfully within their communities, this shift highlighted the importance of adopting targeted interventions and supportive

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strategies to address both social and self-stigma as central elements of recovery (Morris, 2004).

1. 2. 2 Significance of Independent Living for Individuals with Schizophrenia

Independent living is a pivotal component in the rehabilitation and recovery of individuals with schizophrenia, encompassing the capacity to manage daily activities, make autonomous decisions, and engage meaningfully within society (American Occupational Therapy Association, 2020). This autonomy not only enhances personal dignity and self-worth but also correlates with improved functional outcomes and quality of life (Awad & Voruganti, 2012).

While independent living is a vital goal, achieving it is especially challenging for individuals with schizophrenia relative to other mental health disorders. Cognitive impairments, such as deficits in attention, memory, and executive functioning, are prevalent in schizophrenia and can hinder daily decision-making and problem-solving (O'Carroll, 2018). Negative symptoms, including apathy, social withdrawal, and reduced motivation, further impact the capacity for independent living and may persist even when positive symptoms are managed (Fervaha et al., 2014). Additionally, a significant proportion of individuals with schizophrenia experience

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anosognosia, a lack of insight into their illness, affecting treatment adherence and poses a barrier to maintaining independence (Lehrer & Lorenz, 2014). Collectively, these factors underscore the multifaceted nature of barriers for independent living in individuals with schizophrenia.

1. 2. 3 Role of Subjective Confidence in Independent Living

Independent living requires individuals to engage in goal-directed and self-regulated autonomous behavior, involving a combination of skills, knowledge, and beliefs (Algozzine et al., 2001). These factors have been linked to successful independent living, particularly for the skills and knowledge. For instance, previous studies revealed that younger age (Arns & Linney, 1995), female gender (Andia et al., 1995), visual-motor skills (Brekke et al., 1997), self-care (Sood et al., 1996), functional abilities (Arns & Linney, 1995), family contact (Dickerson et al., 1999), hygiene (Dickerson et al., 1999), fewer negative symptoms (Dickerson et al., 1999), and social participation were associated with individuals' independent living (Dickerson et al., 1999). These findings are useful for clinicians to generate interventions tailored to patients, and are helpful for researchers to understand the

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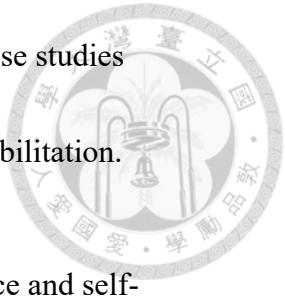
influences of mental illness on patients' functioning. In addition, these studies highlight the importance of independent living in mental health rehabilitation.



However, the associated factors for the belief, such as confidence and self-efficacy, are understudied. Given that individuals with schizophrenia who exhibit similar levels of functioning may report markedly different levels of confidence, confidence is distinct from ability (Hoven et al., 2019). Thus, the factors associated with skills and knowledge perspectives cannot be generalized to those of beliefs. The lack of studies targeting the confidence in independent living may hamper the translations from capacity into actual performance, as shown in a study where it influenced functional skills among patients with adequate illness insight (Kurtz et al., 2013). To optimize patients' confidence in independent living, investigating factors associated with confidence in independent living is the prerequisite.

1. 2. 4 Role of Proxy Perspectives in Independent Living

Proxies tend to play a pivotal role when data cannot be directly obtained from patients. Moreover, proxies often provide essential support and make decisions regarding the patient's living arrangements, treatment adherence, and functional

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abilities (Brekke et al., 1997). Therefore, understanding with proxy's perception with the confidence of independent living is important.

Research indicates that discrepancies between patient self-assessments and proxy evaluations have been frequently reported (Becchi et al., 2004), particularly in subjective domains, such as confidence and self-efficacy. For instance, a study comparing quality of life assessments found only modest agreement between patients with schizophrenia and their proxies (Becchi et al., 2004), suggesting that proxies may not fully capture patients' internal states. Thus, although proxies provide valuable and complementary information for clinical interventions, patient- and proxy-reported data should be assessed and interpreted separately.

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Chapter 2. Research Question

2. 1 Aims of the Study

This study had two primary objectives. First, to identify factors associated with patient-reported confidence in independent living among individuals with schizophrenia. Second, to identify factors associated with proxy-reported confidence in independent living based on their observations of individuals with schizophrenia. By examining both perspectives separately, the study aimed to provide a more comprehensive understanding of the factors that support independent living for this population.

2. 2 Hypothesis and Expected Values

This study hypothesized that both patient-reported and proxy-reported confidence in independent living will be associated with basic functional abilities, such as cognition, mobility, and self-care (Arns & Linney, 1995; Sood et al., 1996). These associations would support the value of interventions that prioritize overall functionality in rehabilitation planning. Additionally, demographic variables, such as age and gender (Andia et al., 1995), are expected to have minimal influence on confidence in independent living, suggesting that the findings may be applicable across a wide range of demographic groups. By examining the perspectives of both

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patients and proxies independently, the study may inform individualized strategies that reflect the unique insights and priorities of each group.

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Chapter 3. Methods

3.1 Dataset

This study utilized data from the Taiwan Databank of Persons with Disabilities, a comprehensive nationwide database established in July 2012 to collect information on individuals applying for disability evaluation and social welfare support in Taiwan. Overseen by the Health and Welfare Data Science Center, the databank provides extensive demographic and health-related data, including diagnosis, level of disability, age, gender, education level, and work status. The data were reported by patients themselves in principle. However, if cognitive impairment was suspected to compromise the validity of self-reporting, the data were instead reported by proxy respondents, such as family members or caregivers. Access to and utilization of the data were approved by the Ministry of Health and Welfare. Data analysis was approved by a local Institutional Review Board.

For this study, data of individuals with schizophrenia (codes 295, F20, and F25) were extracted according to the International Classification of Diseases, Ninth Revision, Clinical Modification and Tenth Edition. To minimize potential confounding effects, individuals with other diagnoses, such as stroke, Parkinson's disease, depression, or mania and those with any missing response were excluded.

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3.2 Measures

This study employed the World Health Organization Disability Assessment Schedule 2.0 (WHODAS 2.0), a standardized and internationally validated tool for assessing disability (Üstün, 2010). Grounded in the International Classification of Functioning, Disability, and Health, WHODAS 2.0 captures the full experience of disability by considering body functions, activities, participation, and contextual factors (Üstün, 2010). Furthermore, the WHODAS 2.0's design allows for assessments to be completed by both patients and proxies, enabling comparisons between self-perceived and externally observed functioning. Its sensitivity to varying levels of disability ensures nuanced evaluations across diverse populations (Üstün, 2010). Its holistic framework makes it especially suitable for identifying factors related to independent living confidence among individuals with schizophrenia.

The WHODAS 2.0 had a total of 36 items, which can be divided into the aforementioned six domains (Appendix 1). According to the WHODAS 2.0 manual, the tool can be administered in self-report, interviewer-administered, or proxy formats, each designed to maintain clarity and reliability. Each item was rated on a five-level scale from "none" (0) to "extreme" (4), allowing for nuanced assessments

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of functional limitations. The item scores can be aggregated into both domain and total scores. A higher score indicates a greater disability.

The WHODAS 2.0 has been validated as a reliable and effective tool for assessing functional limitations and participation restrictions in individuals with schizophrenia. Its psychometric properties have been extensively studied, demonstrating strong test-retest reliability, with intra-class correlation coefficients ranging from 0.69–0.89 at the item level, 0.93–0.96 at the domain level, and 0.98 at the overall level, including schizophrenia cohorts (Ertugrul & Ulug, 2004; McKibbin et al., 2004). Furthermore, the WHODAS 2.0 Traditional Chinese Version has shown strong psychometric properties in Traditional Chinese-speaking individuals with disabilities and chronic illnesses. The instrument demonstrated satisfactory construct validity, with a good model fit ($\chi^2/df = 3.05$, RMSEA = 0.053, CFI = 0.912, SRMR = 0.076), high internal consistency (Cronbach's $\alpha = 0.98$), and significant concurrent and convergent validity, including correlations with the COOP/WONCA charts (partial correlation coefficients ranging from 0.26 to 0.74) (Cheung et al., 2015). These findings confirm that the WHODAS 2.0 Chinese Traditional Version is a reliable and valid measurement. In this study, the 32-item version of WHODAS 2.0 was adopted, consistent with the manual's guidance to exclude four work- and education-related items when respondents are not in gainful employment.

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3.3 Statistical Analysis

All statistical analyses were conducted using IBM SPSS Statistics version 29.0.2.0. Multiple linear regression analyses were performed independently for the self-reported and proxy-reported groups to identify factors associated with confidence in independent living. Within the self-care domain, the item “Staying by yourself for a few days?” was selected as an indicator of confidence in independent living. The associated factors were selected from the remaining items of the same measure.

The patients’ sex and age were initially entered into the model as control variables, given their well-established associations with performance of independent living in schizophrenia (Andia et al., 1995; Arns & Linney, 1995). Then, a forward stepwise selection method was applied to identify additional significant predictors. This method added variables sequentially to the model based on partial F-tests of statistical significance ($p < 0.05$), starting from the baseline model that includes sex and age (Chowdhury & Turin, 2020; Field, 2024). The unstandardized regression coefficient (b) indicates the expected change in the dependent variable for a one-unit increase in the predictor, controlling for other variables (Miles & Shevlin, 2000).

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The coefficient of determination (R^2) was used to evaluate the explanatory power of the regression models. The R^2 value represents the proportion of variance in confidence in independent living explained by the independent variables. In social science research, R^2 values exceed 0.50 were often considered acceptable (Ozili, 2023). The adjusted R^2, which accounts for the number of predictors in the model, was also reported to provide a more accurate measure of model fit (Miles, 2005).

The multicollinearity of regression models was examined using variance inflation factors (VIF) (O'brien, 2007). VIF values exceeding 10 may indicate significant multicollinearity that could affect the reliability of the regression coefficients (Shrestha, 2020).

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Chapter 4. Results

4.1 Participant Characteristics

Table 1 presents the characteristics of the participants. Complete data were extracted from 95 patients with schizophrenia and 108 proxies who responded to the assessments on behalf of patients. Because approximately 91% of the patients were also diagnosed with dementia, their data were retained and analyzed. The average age was significantly higher in the proxy-reported group compared to the self-reported group (70.4 ± 12.6 vs. 63.9 ± 11.9 years, $p < 0.001$). Men outnumbered women in the self-reported group compared to the proxy group (57.9% vs. 35.2%, $p < 0.001$). The distribution of disability levels also varied significantly between the two groups, as determined by a chi-square test (χ^2, $p = 0.002$). In the self-reported group, the largest proportion reported moderate disability (46.3%), followed by severe (32.6%) and extremely severe (12.6%). Conversely, the proxy-reported group exhibited the most participants with severe disability (46.3%), followed by extremely severe (25.0%) and moderate (23.1%).

4.2 Factors Associated with Confidence in Independent Living (Self-Reported Group)

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Table 2 displays the factors identified for the self-reported group. Four variables explained 73% of the variance adjusted for the model complexity. Most factors showed positive associations with confidence in independent living, including long-distance walking in the mobility domain (b = 0.84, $p < 0.001$), learning a new task in the cognition domain (b = 0.46, $p < 0.001$), and joining community activities in the social participation domain (b = 0.29, $p = 0.003$). In contrast, one factor, standing for long periods in the mobility domain (b = -0.39, $p = 0.003$), was negatively associated with confidence in independent living. The VIF values ranged from 1.2 to 5.0.

4.3 Factors Associated with Confidence in Independent Living (Proxy-Reported Group)

Table 3 presents the factors identified for the proxy-reported group. A broader set of factors explained 57% of the variance in confidence in independent living. Among them, four factors showed positive associations: standing for long periods in the mobility domain (b = 0.41, $p < 0.001$), making new friends in the getting along domain (b = 0.63, $p < 0.001$), getting dressed in the self-care domain (b = 0.46, $p < 0.001$), and remembering important things in the cognition domain (b = 0.43, $p = 0.007$). Conversely, four factors exhibited negative associations: understanding what

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people say in the cognition domain (b = -0.29, p = 0.022), moving around inside the home in the mobility domain (b = -0.22, p = 0.008), concentrating on tasks for 10 minutes in the cognition domain (b = -0.43, p = 0.006), and sexual activities in the getting along domain (b = -0.23, p = 0.045). The VIF values ranged from 1.1 to 3.7.

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Chapter 5. Discussion

5. 1 Model Validity and Overall Interpretation

The explained variance in the regression models for both groups was moderate to high, with adjusted R^2 values for the self- and proxy-reported group of 0.73 and 0.57, respectively. Notably, the adjusted R^2 values were similar to the raw R^2 values (0.75 and 0.61), indicating that the models were not overfitted and suggesting good generalizability. Furthermore, all VIF values were smaller than 5, supporting the assumption that multicollinearity was not a concern. These indicators collectively affirm the validity and stability of the models, allowing confidence in the identified predictors of confidence in independent living.

5. 2 Discussion of Associated Factors for Patient-Reported

The regression model for the patient-reported data explained a substantial proportion of variance, with an adjusted R^2 value of 0.73. These relatively large values support the validity of the regression model and thereby the factors associated with patients' confidence in independent living (Lubotsky & Wittenberg, 2006). The high R^2 values may have two interpretations. First, the patients had similar considerations while evaluating their confidence in independent living, resulting in

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significant and large explained variance. Based on this explanation, these factors may serve as preliminary targets for clinical interventions, as they appear to be commonly associated with confidence in independent living across patients. Second, the associated factors were selected from the same measure, the WHODAS 2.0, which might have contributed to the high explanatory power. However, because only specific items from each domain were retained in the final model, the factors are more likely to reflect patient-perceived perspectives rather than reflecting overfitting.

In the patient-reported group, three out of four factors showed positive associations with confidence in independent living. The first was long-distance walking (mobility domain). This finding is generally consistent with those in previous studies, as a study showed that an eight-month exercise program led to approximately 44.6% increase in walking distance and 17.1% improvement in quality of life in patients with schizophrenia (Kaltsatou et al., 2015). These results highlight the importance of enhancing physical endurance, particularly for long-distance mobility, for optimizing patients' confidence in independent living.

The second was learning a new task, reflecting the critical role of cognition in supporting independent living. The findings are consistent with those in previous studies, given that a prior research reported that cognitive impairments are strongly

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linked to difficulties in maintaining employment and managing daily responsibilities (Harvey et al., 2019). Considering that various cognitive interventions have been developed to address these challenges (Chen et al., 2024), such as computerized training, virtual reality, and cognitive strategy instruction. Moreover, the effectiveness of these cognitive intervention was preliminarily support in previous research, such as a randomized controlled trial reported that intensive training significantly improved functional outcomes with sustained effects at six-month follow-up (Subramaniam et al., 2014). Thus, cognitive rehabilitation may be considered to improve patients' confidence in independent living, especially for the confidence in learning a new task.

The third was joining community activities. This finding aligns with community-based interventions such as the Independence through Community Access and Navigation program, which has shown that structured engagement in meaningful leisure activities can enhance planning skills, social motivation, and a sense of empowerment (Snethen et al., 2012). By fostering purposeful community involvement and strengthening social identity, such interventions may directly boost individuals' confidence in managing daily life and living independently.

5. 3 Discussion of Associated Factors for Proxy-Reported

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The regression model explained 57% of the variance in the proxy-reported data. Although this is lower than the variance explained in the patient-reported model, it remains substantial and meaningful in the context of real-world analysis, indicating the model's adequacy in capturing factors related to proxies' confidence in patients' independent living.

The slightly lower explanatory power may be attributed to two reasons. Frist, the heterogeneity among proxy respondents may be high, as the proxies may be family members, hired caregivers, or institutional staff. Given that these respondents may have different experiences and knowledge about mental illness, their focus on confidence in independent living might have differed. Second, proxies cannot directly experience the patient's internal state (Becchi et al., 2004). Therefore, their perceptions may be shaped by environmental factors or their own caregiving context, resulting in less consistency across responses. These factors likely contribute to the lower R^2 value observed in the proxy model.

Despite these limitations, the proxy-reported model identified eight factors associated with their confidence in independent living. Specifically, four factors showed positive associations with confidence in independent living, which may offer actionable clinical indicators. For example, standing for long periods was positively

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associated with the confidence in independent living, suggesting that proxies may concern the patients' physical function, particularly for patients' endurance in standing. To address the proxies' concerns, resistance training or balance-focused programs may be provided to the patients, as these interventions have been shown to increase lower-limb strength and reduce sedentary behavior in patients with schizophrenia (Korman et al., 2023; Szortyka et al., 2023).

The second factor, making new friends, reflects the importance of social functioning in shaping caregiver perceptions of autonomy. The findings are unsurprising because patients with schizophrenia tend to have deficit in social functioning, which increases their difficulties in initiating and maintaining interpersonal relationships. Given that making new friends requires multiple interpersonal skills, such as social cognition, social skills, and environmental support, interventions targeting these abilities may be considered to improve patients' social functioning and reduce proxies' worries, as these interventions can lead to improvements in both social functioning and quality of life (Green, 2016). For instance, broader community-based psychosocial interventions, including supported employment, supported housing, family interventions, and peer-led programs, have also demonstrated positive effects on autonomy, social inclusion, and empowerment (Killaspy et al., 2022). In general, although the importance of social functioning has

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been well-documented in previous research (Green, 2016; Killaspy et al., 2022), our findings preliminarily suggest that the difficulty in making new friends could be empirically associated with proxies' confidence in independent living.

Third, getting dressed was also positively associated with confidence in independent living. These findings are consistent with the existing evidence, as occupational therapy interventions targeting dressing skills have demonstrated effectiveness in promoting independence in activities of daily living (Liberman et al., 1998). Another study found that early programs during hospitalization have yielded higher self-care independence scores at discharge, validating the role of interventions focusing on skills required for independent living (Tanaka et al., 2014). These findings provide empirical support for interventions targeting getting dressed. In addition, given that the associations between getting dressed and confidence in independent living were found in the proxy-reported group only, discussions on the importance of these daily care activities may help address the misunderstanding caused by the perceptual discrepancies.

Finally, remembering important things was positively associated with proxies' confidence in independent living, highlighting the role of prospective memory. Previous intervention studies have demonstrated that prospective memory can be

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enhanced through structured cognitive strategies. For example, a randomized controlled trial among older adults with low medication adherence showed that a multifaceted intervention incorporating cue-based routines, implementation strategies, and associative encoding techniques significantly improved adherence rates in the short term (Insel et al., 2016). The intervention was particularly effective for individuals with lower executive functioning, underscoring the potential of such memory supports in populations with cognitive impairments. As a result, targeting prospective memory through cognitive remediation or compensatory strategies may enhance autonomy and increase caregiving trust in individuals with schizophrenia.

5. 4 Unexpected Findings, Possible Explanations, and Clinical applications

Some factors showed negative regression coefficients with confidence in independent living, which are counterintuitive. For instance, standing for long periods in the patient group, as well as general comprehension, indoor mobility, concentration, and sexual activities in the proxy group, were negatively associated with confidence in independent living. These findings suggest that greater perceived difficulties in these activities might paradoxically correspond to higher reported

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confidence in independent living. Therefore, these findings are unexpected and would be interpreted carefully to avoid misleading.

The unexpected findings may have two explanations. First, the expectations from patients and proxies may have been heightened. When expectations are high, even minor perceived difficulties may be magnified, leading to more critical evaluations of patients' capabilities. Second, proxies tend to be caregivers. Therefore, they may be more sensitive to riskier behaviors, such as navigating complex environments or making decisions autonomously, which may have paradoxically lowered their confidence in the patient's ability to live independently (Zhang et al., 2024). Although the actual reasons could not be clarified in the current study, the findings are less likely to be biased by multiple collinearities. Thus, the findings may still be valid and can be informative for clinicians and researchers.

To better understand these results, future research should check if these negative associations consistently appear across different clinical samples. If the negative associations are persisted, two possible actions may be considered for clinical work. First, we can help patients and proxies set more realistic expectations through education or goal-setting, helping them maintain realistic yet hopeful views of their capabilities. Second, we can assist caregivers in adjusting their risk assessments

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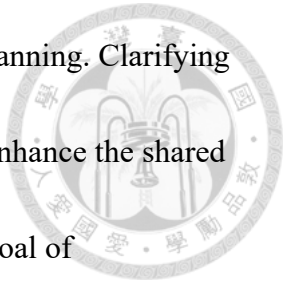
through structured communication, training, or collaborative care planning. Clarifying the emotional and cognitive factors behind proxy reports may also enhance the shared understanding between patients and proxies, further to achieve the goal of independent living.



5. 5 Study limitation

Four issues should be considered while interpreting the current findings. First, although we initially attempted to exclude individuals with a comorbid diagnosis of dementia. However, this criterion was not entirely feasible in this dataset, as almost all participants had a dual diagnosis of schizophrenia and dementia (91%). Furthermore, given that we had insufficient data for conducting sub-group analysis, the results might have been confounded by dementia-related factors, and are not generalizable to a general population with schizophrenia.

Second, the participants in the proxy-reported group were significantly older than those in the patient-reported group. Although the patients' age has been statistically controlled by being included in the regression model, the discrepancies might have influenced the selected factors, and required further cross-validation.

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Third, the participants in the patient-reported group exhibited higher levels of disability than those in the proxy-reported group. Similarly, the relatively small sample size in this study restricts the ability to perform subgroup analyses. Thus, the differences in the selected variables may be affected by the differences in the patients' levels of disability, which cannot be ruled out from the current study.

Fourth, the self-reported data from patients and the proxy-reported data were collected from different individuals, making it difficult to directly compare their perspectives. Moreover, the limited sample size constrained our exploration regarding the identities of the proxy respondents, such as whether they were family members, professional caregivers, or institutional staff. As a result, the findings do not constitute direct evidence for the differences between patients' and proxies' perspectives while evaluating the confidence in independent living.

5. 6 Suggestions for future studies

Several directions could be considered in future studies. First, our findings could be cross-validated by recruiting a larger sample and collecting both patient- and proxy-reported scores from the same individuals. Second, the effects of intervention strategies informed by the associated factors could be evaluated using rigorous

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methodologies, such as randomized controlled trials. Third, the explanatory power of both proxy- and patient-reported models could be increased by using items from other disease-specific questionnaires, such as the Schizophrenia Quality of Life Scale (Wilkinson et al., 2000). Finally, future studies could expand the findings by examining individuals with mismatched confidence and actual performance, such as those exhibiting low ability but high confidence. Collectively, such studies could provide direct and actionable evidence to inform the development of more effective clinical interventions in mental health rehabilitation.

5. 7 Broader Clinical Implications and Recommendations

The findings of this study offer valuable implications for clinical practice. First, clinical assessment should incorporate information from both patients' and proxies' perspectives, as the factors associated with confidence in independent living differed between the two respondents and were not interchangeable. Second, intervention programs for patients could be tailored based on the factors selected from the patient-reported data to increase their confidence in independent living. Third, proxies may benefit from assistance informed by the factors from the proxy-reported data to better understand and assist patients.

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Chapter 6. Conclusion

Our study identified four and eight factors associated with the confidence in independent living from the patient- and proxy-reported models. These factors, across mobility, cognition, self-care, and social functioning, offer concrete targets for clinical intervention to enhance functional independence among individuals with schizophrenia. Given the factors were largely different across patients and proxies, both perspectives should be incorporated in assessment and intervention planning.

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Tables

Table 1: Participants' characteristics

	Self (*n* = 95)	**Proxy (*n* = 108)**	***p*-value**
Age, Mean ± SD	63.9 ± 11.9	70.4 ± 12.6	<0.001
Men, *n* (%)	55 (57.9)	38 (35.2)	<0.001
Level of Disability, *n* (%)			0.002
Mild	8 (8.4)	6 (5.6)	
Moderate	44 (46.3)	25 (23.1)	
Severe	31 (32.6)	50 (46.3)	
Extremely Severe	12 (12.6)	27 (25.0)	

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Table 2: Self-reported group result

Domain	Variable	b	R^2	Adjusted R^2	VIF
	Sex	0.07	-	-	1.2
	Age	0.00	0.03	0.01	1.2
Mobility	Walking a Long Distance	0.84	0.58	0.57	4.9
Cognition	Learning a New Task	0.46	0.70	0.69	2.0
Mobility	Standing for Long Periods	-0.39	0.72	0.71	5.0
Social Participation	Joining in Community Activities	0.29	0.75	0.73	2.2

Note: b = unstandardized regression coefficient; R^2 = coefficient of determination; VIF = variance inflation factors

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Table 3: Proxy-reported group results

Domain	Variable	b	R^2	Adjusted R^2	VIF
	Sex	0.46	-	-	1.1
	Age	-0.01	0.02	0.01	1.1
Mobility	Standing for Long Periods	0.41	0.35	0.34	3.6
Getting along	Making New Friends	0.63	0.46	0.44	3.0
Self-care	Getting Dressed	0.46	0.50	0.47	2.0
Cognition	Understanding What People Say	-0.29	0.52	0.49	3.4
Mobility	Moving Around inside Home	-0.22	0.55	0.52	2.9
Cognition	Concentrating 10 Minutes	-0.43	0.57	0.53	4.2
Cognition	Remembering Important Things	0.43	0.59	0.55	3.7
Getting along	Sexual Activities	-0.23	0.61	0.57	2.0

Note: b = unstandardized regression coefficient; R^2 = coefficient of determination; VIF = variance inflation factors

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Appendix

Appendix 1: WHODAS 2.0 Items(32-item version)

Domain	Items
Cognition	Concentrating on doing something for ten minutes, Remembering to do important things, Analysing and finding solutions to problems in day-to-day life, Learning a new task, for example, learning how to get to a new place, Generally understanding what people say, Starting and maintaining a conversation
Mobility	Standing for long periods such as 30 minutes, Standing up from sitting down, Moving around inside your home, Getting out of your home, Walking a long distance such as a kilometre [or equivalent]
Self-care	Washing your whole body, Getting dressed, Eating, Staying by yourself for a few days
Getting Along with Others	Dealing with people you do not know, Maintaining a friendship, Getting along with people who are close to you, Making new friends, Sexual activities
Life Activities	Taking care of your household responsibilities, Doing most important household tasks well, Getting all the household work done that you needed to do, Getting your household work done as quickly as needed
Participation in Society	How much of a problem did you have joining in community activities (for example, festivities, religious or other activities) in the same way anyone else can, How much of a problem did you have because of barriers or hindrances in the world around you, How much of a problem did you have living with dignity because of the attitudes and actions of others, How much time did you spend on your health condition, or its consequences, How much have you been emotionally affected by your health condition, How much has your health been a drain on the financial resources of you or your family, How much of a problem did your family have because of your health problems, How much of a problem did you have in doing things by yourself for relaxation or pleasure

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