Cognitive Function and Quality of Life in Institutionalized Elderly: Each Predictors and Both Influences

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Abstract

Elderly individuals are susceptible to cognitive impairment as a result of age-related physical and biological changes, which often manifest as memory issues and declines in mental acuity. Such cognitive impairment can lead to a reduced quality of life (QOL) due to increased dependency. This study aims to investigate the impact of cognitive function on QOL among elderly individuals living in institutionalized settings and identify the primary predictor for both variables within this population. This cross-sectional study involved 145 elderly residents at a private nursing home in Surabaya, Indonesia. Data collection was performed using the Mini Mental State Exam (MMSE) and the Older People Quality of Life (OPQOL) questionnaires. Data analysis was conducted using linear and ordinal regression tests ($\alpha<0.05$). The majority of the elderly participants exhibited normal cognitive function (mean MMSE score: 23.65±5.07) and satisfactory QOL (mean OPQOL score: 114.66±10.20). Among the various factors considered, time orientation was identified as the most significant predictor of cognitive function, explaining 63.9% of the variance (p=0.000). Conversely, looking forward to future experiences was found to be the most influential predictor of QOL, accounting for 47% of the variance (p=0.000). These findings highlight the importance of precise time orientation in maintaining normal cognitive function and the significance of having a positive outlook on the future to enhance overall QOL. While cognitive function was observed to significantly influence QOL in institutionalized elderly individuals (p=0.004), its contribution was relatively modest, explaining only 5.7% of the variance in QOL within this population ($R^2=0.057$).

Keywords: cognitive function, elderly, nursing home, quality of life

Introduction

Every individual undergoes the natural aging process, encompassing both biological and psychological changes in their lifetime (Padila, 2013). As people advance in age, they encounter alterations in their physical, cognitive, and psychosocial aspects of life (Erman, et al., 2022). These

changes progressively affect various physiological functions and bodily systems in the elderly. Age-related physiological transformations lead to diminished functional capacity, resulting in self-care challenges, disruptions in daily activities, and psychosocial issues among the elderly (Pavlova, et al., 2015). Such challenges can intensify dependency on others, with diverse implications, especially on overall well-being.

Well-being in the elderly is influenced by several determinants, including health (in general), leisure activities, environmental quality, functional capacity, satisfaction levels, social interactions, networks, and support systems. Well-being and health status improvement in the elderly are intricately linked to their quality of life (QOL). It is imperative to continuously assess both the subjective and objective dimensions of QOL in the elderly from multiple perspectives (Garcia & Navarro, 2018). These determinants of QOL in the elderly largely overlap with those of well-being and include demographic characteristics such as age, ethnic background, racial specifications, adaptation to age-related changes, literacy, feelings of loneliness, and self-care behaviors (Kousha, et al., 2022).

Quality of life (QOL) is a reflection of an individual's perception of their life satisfaction (Philips, et al., 2013). QOL scores tend to decline with advancing age (Bozkurt & Yilmaz, 2016). QOL serves as a metavaluable factor that significantly impacts the health and social welfare of the elderly (Garcia & Navarro, 2018). Generally, QOL encompasses four primary domains: physical health, psychological well-being, social relationships, and the environment (WHOQOL Group; cited in Kumar, et al., 2014). In the context of the elderly, QOL encompasses eight domains, which include overall life assessment, health, social relationships, independence, control over one's life, freedom, home and neighborhood, psychological and emotional well-being, financial circumstances, and leisure activities (Bowling, et al., 2013).

Furthermore, when considering living arrangements, QOL for elderly individuals residing in their homes (community-dwelling elderly) comprises nine domains: autonomy, role and activity engagement, health perception, relationships, attitude and adaptation, emotional comfort, spirituality, home and neighborhood, and financial security (van Leeuwen, et al., 2019). On the other hand, for elderly residents of nursing homes (long-term care facilities), QOL is divided into two major domains: positive and negative self-assessments. Positive aspects include the ability to be

alone when desired, making choices about clothing, accessing needed services, and being treated with dignity by staff. Conversely, less positive (negative) aspects encompass staff familiarity with the resident's life story, availability of enjoyable activities on weekends, opportunities for social engagement, and friendly interactions with staff (Morris, et al., 2018).

One of the most prevalent age-related physical and biological changes experienced by the elderly is a decline in cognitive function. Typically, aging itself is the primary cause of cognitive impairment, with contributing factors including family history, physical inactivity, and various diseases/conditions (Dhakal & Bobrin, 2021). Moreover, specific factors such as anesthesia type, ketamine use during anesthesia, benzodiazepine and anticholinergic treatments after surgery have been associated with post-operative cognitive decline in older adults (Cartailler, et al., 2021). Additionally, pre-operative indicators like the neutrophil-to-lymphocyte ratio (NLR), monocyte-to-lymphocyte ratio (MLR), and systemic immune-inflammation index (SII) levels in the blood have been linked to cognitive decline in the elderly after surgery (Lu, et al., 2022). Anemia and low hemoglobin concentrations have been identified as independent risk factors that accelerate cognitive decline in middle-aged and elderly individuals (Qin, et al., 2019).

The onset of cognitive decline in the elderly often manifests as memory deterioration or forgetfulness, significantly affecting their daily activities (Aini & Puspitasari, 2016). Mild cognitive impairment and early dementia can lead to impairments in activities of daily living (ADL) (Farias, et al., 2013). Individuals with cognitive impairment are more likely to experience poorer physical functions, ADL limitations, mobility issues, and falls (Doroszkiewicz, 2022). Frailty is another geriatric syndrome often co-occurring with cognitive impairment in the elderly, posing significant risks of greater disability, increased morbidity and mortality, and reduced quality of life (Fabricio, et al., 2020). Independence in performing ADL, especially in the presence of frailty, dementia, or cognitive impairment, is a crucial aspect of quality of life among the elderly. In addition to cognitive functioning and the level of dependency, gender and the type of housing or care setting also play significant roles in determining the quality of life among older adults (Munawar, et al., 2023). For the purposes of this study, a long-term care facility for the elderly served as the study site.

Previous research has indicated a significant relationship between cognitive function and quality of life among community-dwelling elderly individuals (Aini & Puspitasari, 2016). Cognitive complaints, including cognitive difficulties, distress arising from such difficulties, and memory problems, have been associated with lower daily quality of life, increased depression, greater anxiety, elevated perceived stress, and reduced general mental well-being in elderly individuals with normal cognition, mild cognitive impairment, and mild-stage Alzheimer's disease (Stites, et al., 2018). Notably, reported cognitive impairment remains an independent predictor of lower well-being, even after adjusting for age, sex, the location of residential care facilities, dementia stage (advanced), reduced care satisfaction, and perceived staff support among institutionalized elderly individuals (O'Caoimh, et al., 2020).

Quality of life among the elderly is also influenced by social and environmental factors associated with their living arrangements, underscoring the need to understand the extent to which these differences in residence can affect it. Significant differences in quality of life have been observed between community-dwelling elderly and nursing home residents (institutionalized elderly), with nursing home residents reporting lower quality of life (Rohmah, et al., 2012). Nevertheless, the specific influence of cognitive function on quality of life in institutionalized elderly individuals in nursing homes remains unclear. This study seeks to analyze the impact of cognitive function on quality of life in institutionalized elderly individuals and identify the most influential predictor of both variables within this population. These findings will be invaluable for developing targeted nursing interventions aimed at enhancing cognitive function and quality of life, particularly for those residing in nursing homes as they age.

Method

Participants

This cross-sectional study was conducted at a private nursing home in Surabaya, Indonesia, involving a total of 145 elderly participants. The inclusion criteria for participation in the study were individuals who were at least 60 years old and had a family member responsible for their care in the nursing home, who served as the designated contact person. Exclusion criteria encompassed

individuals who declined to provide consent for participation, those who were hospitalized at the time of the study, and those who exhibited impaired consciousness or disorientation. The sample size of 145 was determined using a total sampling approach, meaning that all eligible individuals from the nursing home were included in the study. Ethical clearance for the study was granted by the Faculty of Medicine at Widya Mandala Surabaya Catholic University (WMSCU), Indonesia.

Data Collection

Data collection for this study took place from February to May 2022. Trained enumerators conducted in-person visits to the respondents in their private rooms. During these visits, the enumerators read the questions or statements from the research instruments, provided explanations, and offered additional information about the items as needed. The respondents' answers were then documented on the instrument sheets to ensure efficiency and accuracy in data collection. It is important to note that there were no conflicts of interest declared between the author of the study and the study funder in relation to both the conduct of this research and its subsequent publication.

Measurement

In this study, data collection involved the use of two instruments: the Mini Mental State Exam (MMSE) by Folstein et al. (1975) to assess cognitive function and the Older People Quality of Life (OPQOL) instrument developed by Gabriel and Bowling (2004) to measure quality of life (QOL). The Indonesian versions of the MMSE and OPQOL were utilized, and references for their adaptation can be found in the works of Lestari et al. (2017) and Vibriyanti and Harfina (2022), respectively.

It is important to note that certain items within the MMSE and OPQOL instruments were found to be invalid during the testing phase. Specifically, items 7, 9, and 10 of the MMSE, which pertain to repeating, reading and executing instructions, and writing, respectively, were deemed invalid. Additionally, items 1, 12, 27, 32, 34, and 35 of the OPQOL, which relate to life enjoyment, enjoyment of life with others, financial capability for housing maintenance and household expenses, engagement in life roles appreciation, the significance of religion, beliefs, and philosophy in life, and

the importance of cultural or religious events and festivals for the elderly, were also excluded from the instruments.

The results of the instrument testing indicated that the MMSE had eight valid items with correlations ranging from 0.184 to 0.784, and it exhibited a high level of reliability (Cronbach Alpha = 0.733). Conversely, the OPQOL had 29 valid items with correlations ranging from -0.202 to 0.603 and demonstrated almost high reliability (Cronbach Alpha = 0.697). It is noteworthy that only the data related to QOL was found to be normally distributed (p = 0.704), while the data concerning cognitive function deviated from normal distribution (p = 0.027). However, the data pertaining to cognitive function exhibited a linear relationship with QOL (p = 0.574), thus warranting the utilization of a simple linear regression test to analyze the influence of cognitive function on QOL in the elderly ($\alpha < 0.05$).

It is important to highlight that no multicollinearity issues were detected among the predictors of cognitive function and QOL. Results from the multicollinearity test indicated that the Standard Error (SE) and standardized coefficients (Beta, β) for each item in the MMSE and OPQOL instruments were all less than 1 (SE MMSE = 0.035 - 0.140; β MMSE = 0.067 - 0.347; SE OPQOL = 0.124 – 0.204; β OPQOL = 0.039 – 0.180). Consequently, an ordinal regression test was employed to identify the predictors of cognitive function and QOL since the data for all determinants did not conform to a normal distribution (all $p < \alpha$).

Result

In this study, a total of 145 elderly participants were involved, and a closer look at their demographic characteristics reveals some key trends. The majority of these individuals fell within the age range of 60 to 74 years old, signifying a predominance of older adults in this age group. Additionally, the study population was predominantly composed of females, with a substantial number being married. In terms of ethnicity, Chinese participants were the most prevalent in the sample. When it comes to educational background, most of the elderly individuals had completed their secondary school education. Furthermore, a significant proportion of the participants were

retired, and interestingly, they reported having no monthly income. Another notable finding was that the closest family members, typically their children, played a central role in caring for these elderly individuals. Moreover, the majority of the participants had been residing in the nursing home for a duration of 1 to 3 years and were regularly visited by their spouses once a month. It is noteworthy that many of these elderly individuals had been living with non-communicable diseases (NCDs) for more than six years, but they did not consume specific medications to treat their conditions. This detailed demographic profile provides valuable insights into the characteristics of the study respondents.

Table 1

Demography Characteristic

No.	Characteristic	Frequency	Percentage (%)
1	Age (years old)		
	a. Elderly (60-74)	74	51.03
	b. Old (75-90)	68	46.89
	c. Very old (>90)	3	2.06
2	Gender		
	a. Male	71	48.96
	b. Female	74	51.03
3	Marital status		
	a. Single	33	22.75
	b. Married	58	40.00
	c. Separated / divorced	9	6.20
	d. Widowed	45	31.03
4	Ethnicity		
	a. Javanese	55	37.93
	b. Maduranese	10	6.89
	c.. Chinese	76	52.41
	d. Others	4	2.75
5	Educational background		
	a. Primary school	29	20.00
	b. Secondary school	50	34.48
	c. High school	44	30.34
	d. University graduated	19	11.03
	e. Uneducated	3	2.06
6	Occupation		
	a. Retire	42	28.96
	b. Unemployed	36	17.93
	c. Housewife	33	22.75
	d. Part-timer	34	23.44
7	Monthly income (million IDR)		
	a. < 1.5	27	18.62
	b. 1.5 – 3	34	23.44
	c. > 3	8	5.51
	d. None	76	52.41

No.	Characteristic	Frequency	Percentage (%)
8	Period of living in nursing home (years)		
	a. <1	33	22.75
	b. 1-3	59	40.68
	c. >3 – 6	41	28.27
	d. >6	12	8.27
9	Closest person		
	a. Child	77	53.10
	b. Spouse	15	10.34
	c. Sibling	27	18.62
	d. Friend	26	17.93
10	Family visit		
	a. 2-3 times per-week	40	27.58
	b. Once a week	24	16.55
	c. Once a month	60	41.37
	d. Never	21	14.48
11	Visitor		
	a. Spouse	72	49.64
	b. Child	58	40.00
	c. Friend	15	10.34
12	Illness status		
	a. Communicable disease	1	0.68
	b. Non-communicable disease (NCD)	73	50.34
	c. Healthy	71	48.97
13	Period of illness diagnosis		
	a. Less than a year	5	3.44
	b. 1-3 years	13	8.96
	c. 4-6 years	24	16.55
	d. > 6 years	32	22.06
	e. None	71	48.97
14	Drug consumption		
	a. Oral Anti Diabetes (OAD)	10	6.89
	b. Anti-hypertension	27	18.62
	c. None	108	74.48

The results of the descriptive statistics shed light on the cognitive function and quality of life (QOL) of the study participants. In this analysis, it was found that the majority of the respondents exhibited normal cognitive function, with an average score of 23.65 ± 5.07. Additionally, the data indicated that most participants reported having a sufficient quality of life, as reflected in their mean score of 114.66 ± 10.2 on the QOL assessment. However, it's worth noting that a significant portion of the respondents, specifically 61 individuals, displayed various levels of cognitive impairment, constituting approximately 42.07% of the study sample. These findings provide a comprehensive overview of the measured variables, offering insights into the cognitive health and quality of life of the study

participants. Detailed results can be found in Table 2, which provides a more in-depth breakdown of these measurements.

Table 2
Measured Variables

No.	Characteristic	Frequency	Percentage (%)
1	Cognitive function		
	a. Normal	84	57.94
	b. Mild impairment	42	28.96
	c. Severe impairment	19	13.10
2	QOL		
	a. Low	4	2.76
	b. Sufficient	112	77.24
	c. High	29	20.00

The regression test results revealed significant insights into the relationship between cognitive function and quality of life (QOL) among elderly individuals residing in the nursing home. Notably, cognitive function was found to exert a significant influence on QOL in this population (p = 0.004). However, it's important to note that this influence accounted for approximately 5.7% of the variance in QOL within this group (R^2 = 0.057). This suggests that while cognitive function plays a role in QOL, it is just one of several factors contributing to an individual's overall quality of life. Moreover, when exploring the predictors of cognitive function, it was established that time orientation was the most robust predictor, explaining a substantial portion of the variance in cognitive function (R^2 = 0.639; p = 0.000). In contrast, the ability to imitate did not significantly predict cognitive function.

Regarding QOL, the predictor analysis revealed that looking forward to things was the most influential factor (R^2 = 0.470; p = 0.000). This aspect had a pronounced impact on the quality of life reported by the elderly participants. Conversely, factors such as physical energy and the sense of responsibility to others, which may restrict leisure or social activities, did not significantly predict QOL. Given these findings, it is evident that assessments in nursing care should place a particular emphasis on continuously evaluating time orientation and the ability to look forward to things. By doing so, healthcare providers can more accurately predict changes in cognitive function and quality

of life over time. This proactive approach to assessment can be instrumental in promoting and maintaining the well-being of elderly individuals residing in nursing homes.

Table 3
Predictors of Cognitive Function

Item	Determinant	Pseudo R²	% of Influence	Sig.
1	**Time orientation**	**0.639**	**63.9**	**0.000**
2	Place orientation	0.581	58.1	0.000
3	Registration	0.437	43.7	0.000
4	Attention and calculation	0.552	55.2	0.000
5	Recall	0.381	38.1	0.000
6	Mentioning	0.210	21.0	0.000
8	Doing instruction	0.361	36.1	0.000
11	Imitating	0.035	-	0.075

Table 4
Predictors of QOL

Item	Determinant	Pseudo R²	% of Influence	Sig.
2	Feeling happy much of the time	0.191	19.1	0.000
3	**Look forward to things**	**0.470**	**47.0**	**0.000**
4	Life gets me down	0.220	22.0	0.000
5	Physical energy	0.070	-	0.060
6	Pain	0.136	13.6	0.000
7	Health restriction	0.097	9.7	0.005
8	Healthy to go out	0.237	23.7	0.000
9	Others' help are available	0.123	12.3	0.000
10	Prefer more companionship	0.065	6.5	0.044
11	Others' love & affection are available	0.314	31.4	0.000
13	Having children around is important	0.393	39.3	0.000
14	Healthy enough to be independent	0.215	21.5	0.000
15	Able to please own self	0.113	11.3	0.004
16	Cost of things and pension are incomparable	0.148	14.8	0.000
17	Control over important things in life	0.189	18.9	0.000
18	Feeling safe in living environment	0.219	21.9	0.000
19	Local shops, services & facilities are good	0.237	23.7	0.000
20	Get pleasure from home	0.129	12.9	0.000
21	Friendly neighborhood	0.288	28.8	0.000
22	Taking life for granted & make the best of things	0.225	22.5	0.000
23	Feeling lucky compared to others	0.271	27.1	0.000
24	Tend to look on the bright side	0.225	22.5	0.000
25	Finding compensating activities	0.296	29.6	0.000
26	Able to pay household bills	0.107	10.7	0.003
28	Purchase capability	0.166	16.6	0.000
29	Can't afford enjoyable things	0.129	12.9	0.001
30	Having enjoyable hobbies or leisure	0.239	23.9	0.000

Item	Determinant	Pseudo R^2	% of Influence	Sig.
	activities			
31	Staying involved with things	0.088	8.8	0.010
33	Responsibility to others restrict leisure or social activities	0.036	-	0.258

Discussion

Results showed that cognitive function has significant influence on QOL in elderly living in the nursing home, but its contribution is low (R^2 = 0.057; p = 0.004). This possibly happened because impaired cognitive function could result in worse performance in activities of daily living (ADL). This study finding was supported by a comparative study between 82 elderly living in a nursing home and 74 hospitalized elderly in geriatric psychiatry ward which found that two of the factors associated with lower QOL were lower score on MMSE (worse cognitive function) and impaired function in ADL (Barca, et al., 2011). Another study towards 300 community-dwelling elderly also showed that QOL was significantly low among those with impaired ADL (Kumar, et al., 2014). A specific study towards 759 institutionalized elderly showed that a higher level of physical activity was associated with better cognitive function (Fernandez-Mayoralas, et al., 2015). A comparative study between 152 elderly residents of long-term care homes and 160 community-dwelling elderly showed that regular participation in physical activity could maintain an adequate level of cognitive function which contributed more on overall QOL in community-dwellers than in older and frailer institutionalized elderly adults (Borowiak & Kostka, 2004).

Reduced QOL and impaired ADL were both associated with subjective memory complaints (SMC) in the elderly (Brigola, et al., 2015). The prevalence of SMC depends on age, education, and cognitive performance (Montejo, et al., 2011). In depressive elderly, a study towards 113 older people with previous major depression showed that SMC was associated with immediate recall and delayed verbal recall which express memory performance (Chu, et al., 2017). A study towards 1,637 community-dwelling elderly showed that there was a significant association between SMC with global QOL, every dimension of QOL, and ADL (Montejo, et al., 2012). Another study towards 104 elderly with age-related memory loss showed that the implementation of a cognitive

training program could significantly improve the cognitive performance and QOL perception (Fernandez-Prado, et al., 2012).

In this study, we found most respondents were old Chinese individuals (75-90 years old) and secondary school graduated with normal cognitive function. There is a significant relationship between age and level of education with the cognitive function in the elderly (Rasyid, et al., 2017). A longitudinal study (1996-2004) which was a part of Health and Retirement Study found that education and ethnicity were associated with cognitive function scores across waves, but ethnicity did not greatly impact decline rates and education did not impact decline rates at all (Masel & Peek, 2009). Another study towards 18,982 people aged 51 years old or older which was a part of the 2010 Health and Retirement Study in the USA showed that cognitive scores increased with greater educational attainment for all race/ethnic groups so that education seems beneficial for cognition in old age (Diaz-Venegas, et al., 2016).

In this study we found most respondents had normal cognitive function with sufficient QOL. This study finding was supported by a study towards 226 people aged 70 years old or older which showed that elderly with normal cognitive function had better oral health-related QOL than those with cognitive impairment without dementia and mild dementia (Lee, et al., 2013). This may happen due to lack of mobility which may be different between home environment and nursing home context. It is well accepted that mobility is often closely linked to one's independence, well-being, and QOL. A study towards 220 elderly in 33 nursing homes showed that normally functioning elderly had moderate daily activity levels, but lack of mobility was found in majority so that QOL was not optimal (Doumit & Nasser, 2010). Another comparative study between 122 elderly people living at home and those living in nursing homes showed a statistically significant differences between the functional mobility and QOL values of the elderly people living in a home environment and those living in nursing homes (Yumin, et al., 2011).

In our study, we identified that 13.10% of respondents exhibited severe cognitive impairment, which corresponded to a 2.76% reduction in their quality of life (QOL). It is worth noting that older individuals perceive their ability to maintain independence, autonomy, and individuality as

pivotal factors in determining their QOL (Lee, et al., 2009). Impaired cognitive function is a primary driver of dependency on others (Reuser, et al., 2010). This observation is corroborated by a study involving 220 elderly individuals residing in sheltered accommodations, which emphasized that differences in dependency and QOL among older individuals are more closely linked to cognitive status than age itself (Calero & Navarro, 2011). Furthermore, a comparative study between 33 elderly residents in nursing homes and 25 elderly individuals living in a community setting found that nursing home residents exhibited higher levels of independence, but their QOL was lower (Karakaya, et al., 2009).

Our results revealed that cognitive function in nursing home residents was most significantly predicted by their performance on time orientation (item 1 in the Mini-Mental State Examination - MMSE). This finding is supported by a study involving 505 elderly nursing home residents, which identified time orientation as a robust predictor of cognitive decline over time (Guerrero-Berroa, et al., 2009). The time orientation domain of the MMSE is also recognized as a strong predictor of subsequent cognitive decline in the elderly (Melehin, 2017; Prieto, et al., 2023). Moreover, cognitive function is closely associated with subjective memory complaints (SMC). In a study involving 1,637 elderly individuals who participated in a cognitive performance test, those without orientation failures had a low frequency of SMC (22.2%), whereas those who failed all orientation items had a substantially higher frequency of SMC (93%). This study also indicated that time orientation, QOL, and depression-anxiety are more effective predictors of SMC in the elderly (Montejo, et al., 2011).

The MMSE has been widely used globally to assess cognitive function and gauge cognitive decline. However, in our study, we found that one item in the MMSE (item 11: imitating) could not significantly predict cognitive function in institutionalized elderly individuals. Interestingly, this finding deviates from a previous study conducted by Li, et al. (2016), which investigated 118 patients with amnestic mild cognitive impairment and found a positive correlation between gesture imitation test scores and overall MMSE scores. In a series of three experiments by Maryott & Sekuler (2009), it was demonstrated that older adults tend to make more errors in imitation compared to their younger counterparts. However, they appeared to compensate for memory deficits by employing an abstracted representation (gist) of a sequence. These experiments revealed that changes in the

precision of visual perception and motor control accounted for only a small portion of age-related changes in imitation quality, with the primary age-related change arising from reduced ability to accommodate increases in memory load, likely stemming from diminished capacity to encode or retain detailed information about movement sequences.

Our study also highlighted that QOL in nursing home residents was most effectively predicted by the item "looking forward to things" (item 3 in the Older People's Quality of Life Questionnaire - OPQOL). This item reflects future time perspective and motivation in the elderly. This finding aligns with a study conducted among elderly individuals living at home as part of a nationwide survey, which found that looking forward to things had the highest correlation with overall QOL scores (Bowling, et al., 2013). Elderly individuals often encounter challenges related to their future time perspective, emphasizing the importance of maintaining a positive impact on current behavior by fostering an open-ended future time perspective (Nuttin & Lens, 2014). In a study involving a diverse population of 43,000 adults across Europe, a significant association was identified between future time perspective, age, and health. Subjective well-being was found to be higher and to increase only when future time perspective remained open-ended (Coudin & Lima, 2011). Therefore, despite perceptions of limited future time perspective in old age, continuous efforts to keep it open-ended are essential to motivate the elderly to enjoy their later years.

In recent times, there has been a global trend of using the OPQOL instrument to evaluate the quality of life (QOL) of the elderly in various settings, particularly for research purposes. In our study, we discovered that among the 29 valid items in the OPQOL, two items, namely physical energy (item 5) and responsibility towards others (item 33), could not significantly predict QOL in institutionalized elderly individuals. This finding deviates from a prior study conducted by Chen et al. (2014) among community-dwelling elderly living alone in Shanghai, which found that physical health (self-rated) was independently related to QOL. Additionally, a longitudinal comparative study involving 436 elderly individuals, comprising 253 community-dwellers and 183 institutionalized elderly, revealed a significant correlation between weekly physical energy expenditure and physical function, role physical, vitality, and mental health. Furthermore, QOL scores differed significantly

based on physical activity levels among individuals of the same sex and residence status among the elderly (Salguero et al., 2011). These inconsistencies challenge our study's results.

Regarding responsibility towards others, which can restrict leisure or social activities (item 33 in OPQOL), this aspect did not seem to be as prominent in the context of institutionalized elderly living in nursing homes. Elderly individuals residing in nursing homes typically have fewer responsibilities towards others, such as family and social obligations, and thus restrictions on leisure or social activities are often driven by personal reasons. A study involving 20 elderly individuals across three nursing homes identified leisure activities and social life as two of the most important QOL domains (Hall et al., 2011). Consequently, healthcare professionals working in nursing homes bear the responsibility of promoting access to leisure activities by identifying the interests of the elderly and eliminating social barriers. Residents have the right to access valued leisure activities to support their health and well-being (Causey-Upton, 2015). Another study involving 155 older adults found that social participation was best explained by factors such as better well-being and a stable and higher activity level (Levasseur et al., 2010). Hence, it is crucial to enhance social activities in the nursing home environment through various internally or externally sponsored events to improve social engagement among residents.

However, it's essential to acknowledge the limitations of our study. Firstly, we employed a free translation of instruments from previous studies, which may not have undergone an ideal or systematic translation and instrument testing procedure. As a result, the psychometric properties of both translated instruments were not rigorously assessed. Secondly, our instrument testing procedure involved items' validity and reliability tests conducted directly on the study respondents, referred to as "used trials." This approach may introduce bias or limitations in the evaluation of these instruments. Lastly, the nature of a cross-sectional study makes it challenging to monitor changes in the values of measured variables over time. Given that cognitive function and QOL may improve or deteriorate over time, continuous assessment of both variables is highly recommended, particularly in the case of institutionalized elderly individuals.

Conclusion

In the elderly population residing in nursing homes, the majority exhibited normal cognitive function and reported sufficient quality of life (QOL). Notably, time orientation and a positive outlook toward the future emerged as the most influential predictors of cognitive function and QOL, respectively, accounting for substantial proportions of the variance. Specifically, time orientation explained 63.9% of the variance in cognitive function, while the inclination to look forward to future experiences accounted for 47% of the variance in QOL. These findings underscore the significance of a precise grasp of time in maintaining normal cognitive function and the importance of maintaining an optimistic outlook for optimizing QOL among institutionalized elderly individuals.

However, it's worth noting that the ability to imitate did not significantly contribute to the prediction of cognitive function, indicating that this particular skill may not play a substantial role in assessing cognitive function in this population. Similarly, items related to physical energy and responsibilities towards others, which could potentially limit leisure or social activities, did not emerge as significant predictors of QOL. These findings suggest that factors such as physical energy levels and responsibilities towards others may not strongly influence QOL among elderly residents in nursing homes.

Furthermore, while cognitive function was found to have a significant influence on QOL in this population, it was noted that its contribution was relatively low, explaining only 5.7% of the variance in QOL. This suggests that while cognitive function does play a role in determining QOL among nursing home residents, there are likely other factors and variables that exert a more substantial impact on their overall quality of life.

Acknowledgment

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