Althea Medical Journal
ISSN Online: 2337-4330
https://doi.org/10.15850/amj.v12n4.4214

Original Article

Association of Cognitive Function, Depression, and Social Engagement with Quality of Life among Community-Dwelling Elderly in West Jakarta, Indonesia

Kenneth Noah Wijaya,[1] Linda Suryakusuma,[2] Yvonne Suzy Handajani,[3] Yuda Turana[2]

[1]School of Medicine and Health Sciences, Atma Jaya Catholic University of Indonesia, Indonesia
[2]Department of Neurology, School of Medicine and Health Sciences, Atma Jaya Catholic University of Indonesia, Indonesia
[3]Department of Public Health and Nutrition, School of Medicine and Health Sciences, Atma Jaya Catholic University of Indonesia, Indonesia

Abstract

Background: As Indonesia's elderly population grows, quality of life (QoL) has become a critical indicator of healthy aging. Evidence regarding the influence of cognitive function, depression, and social engagement on QoL remains inconsistent and is often limited to institutionalized elderly. This study examined these associations among community-dwelling elderly in an urban setting.

Methods: A cross-sectional study was conducted at PUSAKA Kebon Jeruk, West Jakarta, from March to November 2023. Ninety-eight participants aged ≥60 years were selected using simple random sampling. Cognitive function was assessed using the Montreal Cognitive Assessment–Indonesian version (MoCA-INA), depression using the Geriatric Depression Scale (GDS), social engagement using the Social Disengagement Index, and QoL using the WHO Quality of Life–Brief Version (WHOQOL-BREF). Data were analyzed using Chi-square, Fisher's exact, and multivariate logistic regression.

Results: Most respondents were female (71.4%), aged 60–74 years (74.5%). The majority demonstrated normal cognitive function (63.3%), good social engagement (90.8%), and no depression. Overall QoL satisfaction was high, particularly in the social relationship (71.4%) and environmental domains (90.8%). Bivariate analysis showed associations between education, cognitive function, social engagement, gender, depression, and specific QoL domains ($p<0.05$). Multivariate analysis identified gender as the strongest predictor of the environmental QoL (OR=5.63, p=0.025), education for social relationship (OR=2.99, p=0.020), and depression for general health perception (OR=3.16, p=0.041).

Conclusions: Cognitive function, depression, education, and social engagement are key determinants of QoL among community-dwelling elderly. Community-based interventions focusing on mental health, cognitive stimulation, and social participation may improve QoL and support healthy aging.

Keywords: Cognitive function, depression, quality of life, social engagement

Althea Medical Journal.
2025;12(4):270–276

Received: February 14, 2025
Accepted: October 18, 2025
Published: December 31, 2025

Correspondence:
Linda Suryakusuma
Department of Neurology, School of Medicine and Health Sciences, Atma Jaya Catholic University of Indonesia, Jalan Pluit Selatan Raya No.2, Penjaringan, North Jakarta, Indonesia 14440

E-mail:
linda.suryakusuma@atmajaya.ac.id

Introduction

Indonesia is entering the aging population phase, marked by a steadily increasing proportion of older adults.[1] This demographic transition highlights the importance of quality of life (QoL) as a key indicator of well-being, since longer life expectancy alone is insufficient without ensuring good physical health, psychological well-being, social relationships, and a supportive environment. Quality of life defined as an individual's perception of their position in life, has therefore become an essential measure in geriatric health care and social policy.[2] As individuals age, inevitable biological, psychological, and social changes

may reduce functional abilities, alter life perception, and ultimately contribute to a decline in quality of life.[3]

These age-related changes may manifest as cognitive impairment, increased vulnerability to depression, and reduced social engagement, all of which may negatively affect quality of life in older adults. Cognitive function plays a crucial role, as mild cognitive impairment (MCI) affects about 15% of community-dwelling older adults worldwide, and may progress to dementia.[4] Although MCI does not encompass functional deficits, previous studies have linked MCI to functional disruptions, anxiety, and depression, which can adversely influence perceived quality of life.[5] Depression is another major determinant, with prevalence in Indonesia reported at 6.1% and increasing with age.[6] Although depression is closely associated with morbidity, mortality, and accelerated cognitive decline, it often remains underdiagnosed in older adults. In addition, depressive symptoms such as loss of energy and motivation, contribute to functional decline and reduced daily activity, thereby worsening quality of life.[7] Social engagement also represents a critical determinant of quality of life in older adults. Higher levels of social engagement are consistently associated with better physical and mental health outcomes, which in turn enhance overall quality of life.[8]

In Indonesia, several studies on the relationship between cognitive function, depression, and quality of life among older adults have found varied results and predominantly focused on elderly individuals residing in social care facilities.[7,9–11] Evidence among community-dwelling older adults, particularly regarding social engagement, remains scarce and often addresses only specific aspects of this domain.[12] This evidence gap is particularly notable in urban settings, where demographic pressures are rapidly increasing. West Jakarta provides a relevant context, as it has the second largest proportion of elderly residents in Jakarta (22.7% of the province's older population), yet research on social engagement and its impact on quality of life in this setting remains limited.[13] In addition, early detection of mild cognitive impairment in older adults can be challenging, and the use of the Indonesian version of the Montreal Cognitive Assessment (MoCA-INA) may improve detection by providing a more comprehensive evaluation of cognitive function.[14] Therefore, to fill these gaps, this study aimed to examine the associations of cognitive function, depression, and social engagement with quality of life among community-dwelling elderly in West Jakarta, and to identify the most influential factors affecting quality of life in this urban population.

Methods

This study used a descriptive-analytic design with a cross-sectional approach. Data collection was conducted from March to November 2023 at *Pusat Santunan Keluarga* (PUSAKA), a community-based social welfare institution (*Lembaga Kesejahteraan Sosial*, LKS) that functioned as a center for health, social, and spiritual activities for older adults in West Jakarta, Indonesia. The study site was selected based on prior institutional collaboration, accessibility and the relatively high proportion of older adults in West Jakarta, which represented the second-largest elderly population in Jakarta Province. Permission for research activities was obtained from the institution.

The minimum required sample size was calculated using the Lemeshow formula, assuming a 95% confidence level (Z=1.96), prevalence estimates of cognitive impairment and depression from previous studies, and an additional 10% allowance for potential dropouts. The calculated minimum sample size was 62 participants. Ultimately, 100 older adults were successfully recruited and included in the analysis.

Participants were selected using stratified proportional random sampling technique from older adults registered at PUSAKA Kebon Jeruk, West Jakarta. Eligible participants were community-dwelling elderly aged 60 years or older who were registered at PUSAKA and willing to participate by signing informed consent. Both male and female participants who were able to communicate verbally were included. Exclusion criteria included severe visual impairment, inability to communicate, or other medical conditions that could hinder data collection. These conditions were confirmed through brief interviews with participants or their companions.

Study variables included sociodemographic characteristics (age, gender, education), cognitive function, depression, social engagement, and quality of life. Age was categorized into 60–74 years and ≥75 years, gender into male and female, and education into ≤12 years and >12 years. Cognitive function was assessed using the MoCA-INA, which consisted of 30 items with score ranging from 0 to 30. A cutoff score of ≤23

was applied to classify cognitive impairment, as recent evidence shows this threshold provides a better balance of sensitivity and specificity than the conventional score of 26.[14] Depression was measured with the 15-item Geriatric Depression Scale (GDS-SF), categorized as normal (score <5) or depressed (score ≥5). Social engagement was measured using the Social Disengagement Index, covering social activity (worship attendance, group membership, community activities) and social network (marital status, visual and non-visual contact), with scores of 3–4 classified as good and 1–2 as poor. Quality of life was assessed using the WHOQOL-BREF questionnaire, consisting of 26 items across four domains (physical, psychological, social, and environmental), along with two general questions. Domain scores were dichotomized using a cutoff of 60, with scores ≥60 classified as good QoL and scores <60 classified as poor-to-moderate QoL.[15]

Data analysis was performed in three stages. Univariate analysis was conducted to describe the distribution of all variables. Bivariate analyses were conducted using the Chi-square test or Fisher's exact test when expected cell counts were small, with the significance level set at α=0.05. Odds ratios (ORs) with 95% confidence intervals (CIs) were calculated using the Haldane-Anscombe correction to account for zero cell values. Variables with p-values <0.25 in bivariate analysis were subsequently included in multivariate logistic regression to identify the most dominant determinants of QoL. Because social engagement consists of two subdomains (social activity and social network), each subdomain was evaluated separately. Subdomains demonstrating significant association with QoL domains were further assessed in multivariate analysis to identify potential contributing factors. Ethical approval for the study was obtained from the Research Ethics Board of the School of Medicine and Health Sciences, Atma Jaya Catholic University of Indonesia (No: 07/05/KEP-FKIKUAJ/2023).

Results

Of the 100 recruited participants, 98 were included in the final analysis. Most participants were female, aged 60–74 years, and had higher educational attainment. The majority demonstrated normal cognitive function, good social engagement, and absence of depression. Overall quality of life was rated as good by 80.6% of respondents, with the highest satisfaction observed in the social relationships and environmental domains, while the physical and psychological domains showed comparatively lower scores (Table 1).

Bivariate analysis identified several factors significantly associated with

Table 1 Respondent Characteristics, Cognitive Function Depression, Social Engagement, and Quality of Life (n=98)

Variable	Frequency (%)
Age (year)	
60–74	73 (74.5)
≥75	25 (25.5)
Gender	
Male	28 (28.6)
Female	70 (71.4)
Education level	
≤ 12 years	48 (49)
> 12 years	50 (51)
Cognitive function	
Normal	62 (63.3)
Cognitive impairment	36 (36.7)
Depression	
Normal	83 (84.7)
Depression	15 (15.3)
Social engagement (overall)	
Good	89 (90.8)
Poor	9 (9.2)
Social activity (ASOS)	
Good	79 (80.6)
Poor	19 (19.4)
Social network (JSOS)	
Good	81 (82.7)
Poor	17 (17.3)
Overall quality of life	
Poor-moderate	19 (19.4)
Good	79 (80.6)
General health perception	
Poor-moderate	25 (25.5)
Good	73 (74.5)
Physical domain	
Good	53 (54.1)
Poor	45 (45.9)
Psychological domain	
Good	56 (57.1)
Poor	42 (42.9)
Social relationships domain	
Good	70 (71.4)
Poor	28 (28.6)
Environmental domain	
Good	89 (90.8)
Poor	9 (9.2)

Note: ASOS= Social activity subdomain of social engagement

Table 2 Significant Factors Associated with Quality of Life Domains among Community-Dwelling Elderly

Variable	Quality of Life Domain					
	General Health Perception		Environmental		Social Relationships	
	p	OR (95% CI)	p	OR (95% CI)	p	OR (95% CI)
Depression	0.041*	3.16 (1.01–9.89)	0.029*	5.67 (1.32–24.39)	0.092	–
Gender (Female)	0.143	–	0.015*	6.09 (1.40–26.42)	0.138	–
Education Level (>12 years)	0.564	–	1.000	–	0.018*	2.99 (1.18–7.53)
Cognitive Function (Normal)	0.695	–	0.721	–	0.029*	2.69 (1.09–6.63)
Social activity (ASOS – Good)	0.245	–	0.068	–	0.043*	2.84 (1.01–8.02)

Notes: *Bivariat analysis, statistically significant (p<0.05), OR= Odds Ratio; CI= Confidence interval, ASOS= Social activity subdomain of social engagement

specific quality of life domains. Depression was significantly associated with poorer general health perception (OR 3.16; 95% CI 1.01–9.89; p=0.041). Female gender was associated with higher satisfaction in the environmental domain (OR 6.09; 95% CI 1.40–26.42; p=0.015). Higher educational level, cognitive impairment, and social activity were significantly associated with the social relationships domain (p<0.05) (Table 2).

In multivariate analysis, depression remained the dominant factor associated with general health perception (aOR 3.16; 95% CI 1.01–9.89; p=0.048). The environmental domain was independently associated with female gender (aOR 5.63; 95% CI 1.24–25.56; p=0.025) and depression (aOR 5.11; 95% CI 1.10–23.83; p=0.038). For the social relationships domain, higher educational level (aOR 2.99; 95% CI 1.18–7.53; p=0.020), group membership (aOR 4.83; 95% CI 1.41–16.63; p=0.012), and participation in community activities (aOR 3.65; 95% CI 1.30–10.24; p=0.014) were independently associated with better quality of life (Table 3).

Discussion

This study highlights several main findings, suggesting that quality of life among older adults is affected by multiple factors that vary across domains. Most notably, depression emerged as the most consistent factor, being associated with poorer self-rated general health. In addition, higher educational attainment was strongly linked to better quality of life in the social relationships domain, while gender also shaped perceptions of the environment, with female reporting more favorable evaluations. Although social

Table 3 Multivariate Logistic Regression of Factors Associated with Quality of Life Domains

Predictor	Quality of Life Domain					
	General Health Perception		Environment		Social Relationships	
	p	aOR (95% CI)	p	aOR (95% CI)	p	aOR (95% CI)
Depression	0.048*	3.160 (1.010–9.888)	0.038*	5.11 (1.10–23.83)	0.364	-
Gender (Female)	0.207	-	0.025*	5.63 (1.24–25.56)	0.111	-
Education Level (>12 years)	-	-	-	-	0.020*	2.99 (1.18–7.53)
Cognitive Function (Normal)	-	-	-	-	0.189	-
Social activity (ASOS – Good)	-	-	0.192	-	-	-
Group membership	-	-	-	-	0.012*	4.83 (1.41–16.63)
Community activities	-	-	-	-	0.014*	3.65 (1.30–10.24)
Frequency of worship attendance	-	-	-	-	0.076	-

Notes: aOR= adjusted odds ratio; CI= confidence interval; variables included in multivariate models were selected based on bivariate p<0.25. ASOS= Social activity subdomain of social engagement, *Statistically significant (p<0.05)

engagement as an overall construct was not significantly related to quality of life, participation in organized groups appeared to play an especially important role in shaping perceptions within the social relationships domain.

Among these factors, depression emerged as a central determinant, influencing both general health perception and satisfaction with the environmental domain. Older adults who reported depressive symptoms tended to evaluate their health and surroundings less positively. This pattern is consistent with a previous study showing that depression reduces coping ability, heightens focus on physical complaints, and interferes with daily functioning.[16] Such symptoms may also undermine physical, emotional, and cognitive capacities, thereby limiting independence and negatively shaping perceptions of overall health.[11] Other research have similarly shown that depression diminishes satisfaction with environmental aspects such as safety, housing conditions, and access to healthcare and transportation, while also restricting participation in recreational activities and fostering insecurity or negative perceptions of one's surroundings.[17]

In addition to depression, gender has been identified as the strongest determinant of environmental domain, with females reporting more favorable evaluations. This finding aligns with prior studies indicating that improvements in gender equality and women's empowerment may provide greater autonomy in managing both physical and social environments, thereby enhancing environmental satisfaction.[18,19] Women's quality of life ratings have also been linked to non-co-residing care support, perception of safety, and strong social connections, which may help explain the more positive evaluations observed in this study.[20] These findings highlight the importance of gender-sensitive approaches in geriatric care and underscore the need to strengthen community and environmental support systems, particularly for older men.

Education level showed the strongest association with the social relationships domain. This finding is consistent with prior studies linking higher education to broader networks, increased participation in social activities, and greater self-confidence, all of which support social engagement.[2,21,22] Higher education is also associated with preserved cognitive function, including memory and executive processes that support sustained social interactions. These abilities, particularly affective theory of mind or the capacity to interpret emotional cues, are critical for sustaining meaningful relationships.[23,24] Community-based programs that provide lifelong learning, cognitive stimulation, and accessible social activities may be especially beneficial for older adults with lower educational attainment or early cognitive decline.

Overall social engagement did not show a significant relationship with quality of life domains, contrasting with findings from previous studies reporting positive associations.[8] However, further analysis of social engagement subdomains revealed that social activity was significantly associated with social relationship domain. Multivariate analysis showed that among the components of social engagement, membership in a group was the strongest contributor and significantly enhanced quality of life by improving interpersonal communication, strengthening personal relationships, and increasing access to emotional and social support.[25] In addition, participation in various social activities such as charity work, community organizations, and social clubs may further improve well-being, particularly when such activities are perceived as meaningful and enjoyable.[26] Encouraging older adults to engage in groups-based activities may therefore strengthen social relationships, improve well-being, and enhance overall quality of life, making this an important target for policy and intervention.

Not all independent variables showed significant associations with quality of life domains, as some factors were linked only to specific domains. This finding underscores the multifactorial nature of quality of life in older adults and suggests the presence of additional protective or moderating influences.[7,10,27] These findings should be interpreted in light of certain limitations, including the cross-sectional design, the single-site urban setting, and the use of the WHOQOL-BREF instrument. Although this instrument is practical, minimizes respondent burden, and has been widely applied in Indonesian community surveys, it does not capture older-adult-specific domains assessed by WHOQOL-OLD, such as sensory abilities, autonomy, social participation, and concerns about death and dying.[28] The WHOQOL-BREF was selected in this study because it comprehensively covers the four main quality of life domains and is practical for community surveys. The WHOQOL-OLD, although useful for older-

adult-specific domains, was not included because it requires additional items that may increase respondent burden and had not yet been integrated into the study design. Future studies may benefit from combining both instruments for a more comprehensive evaluation. Despite these limitations, this study offers important insights into how depression, gender, education, and social engagement influence quality of life in later life.

In conclusion, depression, education, gender, and social engagement each influence different aspects of quality of life among older adults. These findings suggest that routine depression screening and mental health support should be integrated into geriatric care, and that community programs promoting safe environments, accessible health services, and group-based activities are needed, with particular attention to older men and those with limited education or early cognitive decline.

Acknowledgments

The authors would like to thank all participants and the management of *Pusat Santunan Keluarga* (PUSAKA), Kebon Jeruk, West Jakarta, for their cooperation and support throughout this study.

Author's Contributions

KNW contributed to study conceptualization, data collection, statistical analysis, and preparation of the original draft. YSH provided methodological oversight and expert guidance on study design involving the elderly population. LS and YT contributed to neurological assessment oversight, supervision, and critical review of the manuscript. All authors have read and approved the final version of the manuscript.

Conflict of Interest

The authors declare no conflict of interest regarding the publication of this article.

Funding

This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.

References

1. Badan Pusat Statistik (BPS). Statistik Penduduk Lanjut Usia 2022. Badan Pusat Statistik; 2022. [Cited 2024 December 16] Available from: https://www.bps.go.id/id/publication/2022/12/27/3752f1d1d9b41aa69be4c65c/statistik-penduduk-lanjut-usia-2022.html.
2. Gondodiputro S, Rizki Hidayati A, Rahmiati L. Gender, age, marital status, and education as predictors to quality of life in elderly: WHOQOL-BREF Indonesian version. IJIHS. 2018;6(1):36–41. doi: 10.15850/ijihs.v6n1.1201
3. Murman D. The impact of age on cognition. Semin Hear. 2015;36(03):111–21. doi: 10.1055/s-0035-1555115.
4. Bai W, Chen P, Cai H, Zhang Q, Su Z, Cheung T, et al. Worldwide prevalence of mild cognitive impairment among community dwellers aged 50 years and older: a meta-analysis and systematic review of epidemiology studies. Age Ageing. 2022;51(8):afac173. doi: 10.1093/ageing/afac173.
5. Stites SD, Harkins K, Rubright JD, Karlawish J. Relationships between cognitive complaints and quality of life in older adults with mild cognitive impairment, mild alzheimer's disease dementia, and normal cognition. Alzheimer Dis Assoc Disord. 2018;32(4):276–83. doi: 10.1097/WAD.0000000000000262.
6. Badan Penelitian dan Pengembangan Kesehatan Kementerian Kesehatan, Republik Indonesia. Laporan nasional Riskesdas 2018. Jakarta: Lembaga Penerbit Badan Penelitian dan Pengembangan Kesehatan; 2019.
7. Mahadewi IGA, Ardani IGAI. Hubungan tingkat depresi dengan kualitas hidup pada lansia di Panti Sosial Werdha Wana Seraya Denpasar Bali. E-Jurnal Medika. 2018;7(6):1–8. https://ojs.unud.ac.id/index.php/eum/article/view/41447.
8. Luo M, Ding D, Bauman A, Negin J, Phongsavan P. Social engagement pattern, health behaviors and subjective well-being of older adults: an international perspective using WHO-SAGE survey data. BMC Public Health. 2020;20(1):99. doi: 10.1186/s12889-019-7841-7.
9. Madani T, Biromo A. Hubungan fungsi kognitif dengan kualitas hidup lansia di Panti Sosial Trena Werdha Budi Mulia 2. Tarumanagara Med J. 2022;4(2):346–51. doi: 10.24912/tmj.v4i2.20818.
10. Stuart J, Meiyanti M. Hubungan fungsi kognitif dengan kualitas hidup pada lansia. Media Ilmu Kesehatan. 2020;9(3):251–8. doi: 10.30989/mik.v9i3.290.
11. Utami AW, Gusyaliza R, Ashal T. Hubungan kemungkinan depresi dengan kualitas hidup pada lanjut usia di Kelurahan

Surau Gadang Wilayah Kerja Puskesmas Nanggalo Padang. Jurnal Kesehatan Andalas. 2018;7(3):417–23. doi: 10.25077/jka.v7i3.896.
12. Samper TP, Pinontoan OR, Katuuk ME. Hubungan interaksi sosial dengan kualitas hidup lansia di BPLU Senja Cerah Provinsi Sulawesi Utara. e-Journal Keperawatan. 2017;5(1):1–9. doi: 10.35790/jkp.v5i1.14695.
13. BPS Provinsi DKI Jakarta. Profil penduduk lanjut usia di Provinsi Jakarta. Jakarta: Badan Pusat Statistik Provinsi DKI Jakarta; 2022.
14. Islam N, Hashem R, Gad M, Brown A, Levis B, Renoux C, et al. Accuracy of the Montreal Cognitive Assessment tool for detecting mild cognitive impairment: a systematic review and meta-analysis. Alzheimer's Dement. 2023;19(7):3235–43. doi: 10.1002/alz.13040.
15. Silva SM, Santana ANC, Silva NNBD, Novaes MRCG. VES-13 and WHOQOL-bref cutoff points to detect quality of life in older adults in primary health care. Rev Saude Publica. 2019;53:26. doi: 10.11606/S1518-8787.2019053000802.
16. Peleg S, Nudelman G. Associations between self-rated health and depressive symptoms among older adults: does age matter? Soc Sci Med. 2021;280:114024. doi: 10.1016/j.socscimed.2021.114024.
17. Wróblewska I, Bartyzel M, Chmielowiec B, Puścion M, Chmielewski J. The impact of depression on the quality of life in elderly people. Med Og Nauk Zdr. 2021;27(2):199–204. doi: 10.26444/monz/136243.
18. Vinsalia T, Handajani YS. Life satisfaction is the most significant determinant of quality of life in the elderly. Universa Medicina. 2021;40(1):14–21. doi: 10.18051/UnivMed.2021.v40.14-22.
19. Moirangthem S, Ojha GJ. Gender differences in quality of life and subjective happiness in Indian elderly: a cross-sectional survey. Indian J Occup Ther. 2022;54(2):51–6. doi:10.4103/ijoth.ijoth_32_21.
20. Liu J, Rozelle S, Xu Q, Yu N, Zhou T. Social engagement and elderly health in China: evidence from the China Health and Retirement Longitudinal Survey (CHARLS). Int J Environ Res Public Health. 2019;16(2):278. doi: 10.3390/ijerph16020278.
21. Chi YC, Wu CL, Liu HT. Assessing quality of life with community dwelling elderly adults: a mass survey in Taiwan. Int J Environ Res Public Health. 2022;19(22):14621. doi: 10.3390/ijerph192214621.
22. Talarska D, Tobis S, Kotkowiak M, Strugała M, Stanisławska J, Wieczorowska-Tobis K. Determinants of quality of life and the need for support for the elderly with good physical and mental functioning. Med Sci Monit. 2018;24:1604–13. doi: 10.12659/msm.907032.
23. Krendl AC, Kennedy DP, Hugenberg K, Perry BL. Social cognitive abilities predict unique aspects of older adults' personal social networks. J Gerontol B Psychol Sci Soc Sci. 2022;77(1):18–28. doi: 10.1093/geronb/gbab048.
24. Otsuka Y, Shizawa M, Sato A, Itakura S. The role of executive functions in older adults' affective theory of mind. Arch Gerontol Geriatr.. 2021;97:104513. doi: 10.1016/j.archger.2021.104513.
25. Munford LA, Panagioti M, Bower P, Skevington SM. Community asset participation and social medicine increases qualities of life. Soc Sci Med. 2020;259:113149. doi: 10.1016/j.socscimed.2020.113149.
26. Lestari SK, de Luna X, Eriksson M, Malmberg G, Ng N. A longitudinal study on social support, social participation, and older Europeans' Quality of life. SSM Popul Health. 2021;13:100747. doi: 10.1016/j.ssmph.2021.100747.
27. Eryando T, Ariha D, Daniah, Damayanti YF, Anggraini S. Relationship of age, working and education with/regarding the quality of live of elderly. In: Proceedings of the 1st International Conference on Science, Health, Economics, Education and Technology (ICoSHEET 2019). Semarang: Atlantis Press; 2020. doi: 10.2991/ahsr.k.200723.058.
28. Gondodiputro S, Wiwaha G, Lionthina M, Sunjaya DK. Reliability and validity of the Indonesian version of the World Health Organization quality of life-old (WHOQOL-OLD): a Rasch modeling. Med J Indones. 2021;30(2):143–51. doi: 10.13181/mji.oa.215065.