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Urbanization and Elderly Welfare: Dynamic Evidence from Indonesia

I Made Jyotisa Adi Dwipatna*, Shadry Andriani, Regina Regina, Dirmansyah Darwin, and Hafid Sumarwadji

Department of Economics, Faculty of Economics and Business, State University of Makassar, Makassar, Indonesia

E-mail: made.jyotisa@unm.ac.id

Abstract

This study examines the relationship between urbanization and elderly welfare in Indonesia by integrating social, economic, and demographic dimensions, addressing the widely held assumption that urban development automatically enhances the well-being of older populations. Using balanced panel data from 34 Indonesian provinces for the period 2017–2022, obtained from the Indonesian Central Bureau of Statistics and the Ministry of Health, the study employs a dynamic panel model estimated through the Generalized Method of Moments (GMM) to capture short- and long-term effects while accounting for endogeneity. The results indicate that past elderly welfare conditions do not significantly influence current welfare levels. Urbanization is found to have no statistically significant effect on elderly welfare in either the short or long term. In the short term, health facility availability, poverty levels, and the proportion of elderly individuals negatively affect elderly welfare, whereas economic well-being exerts a positive influence. In the long term, economic well-being remains a key positive determinant, while the proportion of elderly individuals continues to have a negative effect. Overall, the findings demonstrate that elderly welfare in Indonesia is shaped primarily by socioeconomic factors rather than by the pace of urbanization. The study contributes original policy-relevant insights by challenging urbanization-centered development strategies and emphasizing the importance of targeted economic empowerment and inclusive social protection systems to improve elderly welfare.

Keywords: Demographics, Economics of the Elderly, Public Infrastructure, Urban, Welfare, GMM

INTRODUCTION

The phenomenon of population ageing becomes a demographic challenge currently faced by many countries, including Indonesia. The increase in the proportion of elderly people is a direct consequence of demographic transition, characterized by a decline in birth rates and an increase in life expectancy. Globally, the proportion of elderly people is estimated to increase from 12% in 2050 (Abed Zead & Khadir, 2023; Sagyndykova et al., 2016). In

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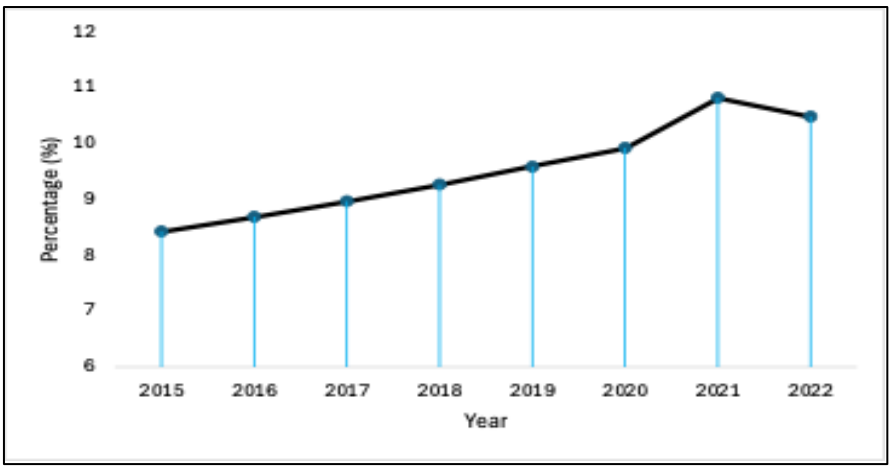
Indonesia, based on data from the Indonesian Central Bureau of Statistics (2023), the proportion of elderly people in Indonesia reached more than 10% of the total population in 2022, and is projected to continue to increase until it enters the ageing society phase in the coming decade. This situation demands serious attention to the welfare of the elderly, not only from an economic perspective but also from social and demographic angles, as this age group is vulnerable to poverty, limited access to healthcare services, and social isolation.

Figure 1. Proportion of Elderly People in Indonesia (2015-2023)



Source: Indonesian Central Bureau of Statistics (2023)

In the middle of these dynamics, urbanization has emerged as a structural phenomenon that shapes the welfare patterns of the population, including the elderly, through the redistribution of resources, changes in the social environment, and regional economic transformation. Urbanization in Indonesia has brought various changes in people's lifestyles and social structures. On the one hand, urbanization can increase per capita income, expand employment opportunities, and encourage the development of infrastructure and public facilities (Noviani et al., 2025). However, on the other hand, this process also presents new challenges for the welfare of the elderly, such as a decline in autonomy, independence, and social attachment (Suvarna & Al Khalifa, 2024). Elderly people living in urban areas often face more complex social, environmental, and health pressures than those living in rural areas (Widagdo et al., 2022; Wiliyanarti, Notobroto, & Hamidah, 2020). This condition indicates that urbanization does not always correlate with increased welfare for all age groups, especially the elderly population who are vulnerable to rapid socio-economic changes.

Based on previous literature studies, the welfare of the elderly is greatly influenced by social interaction, family support, and community. Sociocultural values in Indonesia cause the family being the main source of physical and emotional support for older adults (Demartoto, 2013). However, urbanization is changing this social structure, weakening family ties and increasing the risk of isolation and loneliness (Gunawan et al., 2025). Economically, urbanization can expand opportunities for older adults to participate in productive activities (Munawaroh et al., 2025), but it also increases vulnerability to

poverty for those who do not have adequate access to health services and economic resources (Aini et al., 2024). With the increasing proportion of the elderly population, urbanization policies must be designed into more inclusive way to meet the specific needs of this group, including access to health facilities and elderly-friendly environments (Zhang et al., 2023). Conversely, unplanned urbanization can worsen the health and well-being of the elderly (Colozza et al., 2023; Kurniawan et al., 2022).

While previous research has examined the welfare of elderly, most studies remain confined to isolate several aspects of health or economics, without adequately addressing the structural impact of urbanization—particularly within the context of developing countries, such as Indonesia. Empirical investigations that simultaneously integrate social, economic, and demographic dimensions in analyzing elderly well-being are notably scarce. Moreover, few studies have employed quantitative approaches incorporating a comprehensive set of control variables—such as health facilities, quality of life, poverty, economic well-being, and the proportion of older adults—to explain regional variations in elderly welfare.

The novelty of this study lies in its multidimensional framework, which evaluates the impact of urbanization on elderly welfare in Indonesia by jointly considering social, economic, and demographic determinants. By implementing the Generalized Method of Moments (GMM), the study effectively addresses potential endogeneity issues among variables and contributes new empirical insights into the dynamics of elderly welfare amid the accelerating pace of urbanization in developing countries.

LITERATURE REVIEW

The theory of urbanization explains that population migration from rural areas to cities occurs in response to economic opportunity gaps and living conditions between regions, which are influenced by factors, such as employment opportunities, wage levels, and the availability of facilities (Zhao & Liu, 2022). On the one hand, urbanization improves life satisfaction through infrastructure improvements and access to public services. The development of social, productive, and household facilities significantly improves quality of life, up to 90% of welfare improvements linked to infrastructure advances (Ufimtseva et al., 2016). Nonetheless, urbanization also poses challenges to affective well-being. Population density, social pressure, and a fast-paced lifestyle can increase stress and reduce the mental health of the elderly (Mysyuk & Huisman, 2020; Sarkar & Pujara, 2025).

Thus, the relationship between urbanization and well-being is not linear and varies between regions. Several studies reveal that medium levels of urbanization tend to result in the highest life satisfaction as they are able to balance the benefits of urban facilities with lower life pressures (Lenzi & Perucca, 2018, 2021). Conversely, in Eastern Europe, urbanization tends to have a more negative impact on life satisfaction than in Western Europe, indicating the importance of the socio-economic context in understanding this

relationship (Lenzi & Perucca, 2018; Navarro et al., 2020). Based on above description, the following hypothesis can be constructed.

H1: Urbanization affects the welfare of the elderly.

The correlation between health facilities and elderly welfare is multifaceted, encompassing accessibility (Bratanegara et al., 2025; Y.-T. Yang et al., 2015), psychosocial factor (Schafer et al., 2022; Straatmann et al., 2020), and policy infrastructure (Bhatta et al., 2015). These aspects' improvement can significantly enhance the quality of life and well-being of elderly. Equitable access to services, strong social support, and inclusive health policies have been shown to improve the quality of life and well-being of older adults. In the context of urbanization, these aspects become even more crucial because disparities in facilities and access to services between urban and rural areas can deepen the welfare gap among older adults. Therefore, the research hypothesis can be formulated.

H2: Health facilities have a positive effect on the welfare of the elderly

Quality of life as measured by the Human Development Index (HDI) has a significant impact on the well-being of elderly. The HDI – which encompasses the dimensions of health, education, and standard of living – can moderate the relationship between physical frailty and health-related quality of life in older adults. Several studies show that the HDI can reduce the negative impact of physical frailty on health-related quality of life among older adults in Europe (Ribeiro et al., 2025). Based on the above description, the following hypothesis can be constructed.

H3: Quality of life has a positive effect on the welfare of elderly.

On the other hand, poverty shows a strong negative correlation with the welfare of elderly, where economic limitations restrict the fulfilment of basic needs, such as health, housing, and social support. From a life course perspective, this is an accumulation of inequalities since the productive period, including low education and jobs without social security (Rahayu et al., 2022). In the context of urbanization, urban economic inequality exacerbates this vulnerability, increasing the risk of social exclusion and a decline in the quality of life of elderly. Therefore, the following hypothesis can be constructed.

H4: Poverty has a negative effect on the welfare of elderly.

Furthermore, the correlation between economic welfare (measured by GRDP per capita) and elderly welfare shows a close correlation between regional economic progress and the quality of life of their population. An increase in GRDP per capita reflects a region's ability to provide better public services, health facilities, and social security, which in turn improves the welfare of the elderly (Guo et al., 2025). Nonetheless, this correlation is not always linear as the welfare of the elderly is also influenced by income equality and the effectiveness of social policies. A study conducted by X. Liu et al. (2024) indicates that the subjective welfare of the elderly increases with rising incomes and the expansion of social security, confirming that economic growth is only meaningful when accompanied by inclusive distribution of benefits. Thus, the next hypothesis is as follows.

H5: Economic well-being has a positive effect on the welfare of elderly.

At last, the increase in the proportion of elderly people provides major implications for their physical, mental, and socio-economic well-being, especially in

countries with immature social protection systems. They face a higher risk of chronic diseases and psychological disorders, such as depression, especially those who live alone or without family support (Abed Zead & Khadir, 2023; Manandhar & Joshi, 2019; Santhalingam et al., 2021). Intergenerational emotional support is used to improve subjective well-being and a sense of meaning among elderly (Y. Liu et al., 2021; M. Yang et al., 2022). However, on the other hand, an ageing population has direct implications for increased public expenditure on health and social welfare services, which has the potential to put pressure on fiscal stability, especially in countries with limited resources (Fadzil et al., 2021; Spijker, 2021; Z. Yu et al., 2024). This situation increases the need for a sustainable and efficient social security system. On the other hand, the burden of elderly care is often shifted to family members, which is becoming increasingly challenging due to declining family support and increasing social mobility in modern societies (Aryati et al., 2020). As a result, economic and psychosocial pressures are felt not only by the elderly, but also their families as the primary providers of informal support. Based on the above description, the following hypothesis can be constructed as follows.

H6: The proportion of elderly people has a negative effect on the welfare of the elderly.

METHODOLOGY

This study aims to analyze an empirical model examining the impact of urbanization on elderly welfare using panel data from 34 provinces in Indonesia over a six-years period (2017–2022). The Generalized Method of Moments (GMM) approach was employed, as the welfare of the elderly represents a persistent variable—a key requirement for GMM estimation. Moreover, considering that the number of cross-sectional units (N) exceeds the number of time periods (T) (N > T), the use of the System-GMM (Sys-GMM) method proposed by Blundell & Bond (1998) ensures the consistency and reliability of the estimated results. The implementation of GMM analysis also serves to address potential endogeneity issues, which are frequently overlooked in previous empirical studies.

Table 1. Variable Description

No	Variables	Indicator	Units	Source
Dependent Variable				
1	Elderly Welfare (elderwelf)	100 – elderly dependency ratio	Percentage (%)	Indonesian Central Bureau of Statistics
Independent Variable				
2	Urbanization (urban)	Population density	People/KM^2	Indonesian Central Bureau of Statistics
Control Variables				
3	Health Facilities (healthfac)	Number of Community Health Centers	Unit	Ministry of Health of the Republic of Indonesia
4	Quality of Life (lifequality)	Human Development Index	Percentage (%)	Indonesian Central Bureau of Statistics
5	Poverty (pov)	Poverty rate	Percentage (%)	

No	Variables	Indicator	Units	Source
6	Economic well-being (econwelb)	GRDP per capita	Thousands of rupiah	
7	Proportion of Elderly Population (propelder)	Percentage of Elderly Population	Percentage (%)	

This study used elderly welfare as the dependent variable, operationalized through a transformation of the elderly dependency ratio, calculated as (100 – elderly dependency ratio). The proxy variable for elderly welfare, using 100 – the elderly dependency ratio was employed because it provides a clearer picture of the economic independence of the elderly. Additionally, data on elderly welfare specifically is difficult to obtain. The elderly dependency ratio reflects the proportion of elderly individuals dependent on the working-age population (15-64 years) (Pflaumer, 2024), while by calculating 100 – elderly dependency ratio, it offers an indication of the comparison between the economically active working-age group and the inactive elderly population. A lower elderly dependency ratio implies a higher proportion of elderly individuals capable of maintaining economic independence, directly related to their welfare (Skirbekk et al., 2022). This proxy allows for the assessment of the economic resilience and quality of life of the elderly, as it reflects the extent to which they rely on social support systems and pensions rather than depending on the productive age group.

At the macro-regional level, this indicator serves as a proxy for structural resilience and the potential economic support base available to older adults. Rather than measuring individual-level welfare outcomes directly, the variable captures the demographic and economic environment within which elderly welfare is embedded. Accordingly, the measure reflects the systemic capacity of a province to provide economic backing and intergenerational support, which constitutes a foundational dimension of elderly welfare in a structural development context.

The key explanatory variable included urbanization, proxied by population density, due to the unavailability of provincial-level urbanization data. As noted by Jiang et al. (2021), population density serves as an appropriate proxy for measuring urbanization, as it reflects the degree of population concentration in urban areas. To ensure the robustness and validity of the empirical model, several control variables were incorporated. These were health facilities, measured by the number of community health centers within each province; quality of life, represented by the Human Development Index (Urzúa & Vilbert, 2023); poverty, measured by the provincial poverty rate; economic well-being, captured by gross regional domestic product (GRDP) per capita (Ortega et al., 2022); and the proportion of elderly individuals, measured by their percentage within the total population. Based on these specifications, the research model is formulated as follows.

$$elderwelf_{it} = \alpha elderwelf_{it-1} + \beta_1 urban_{it} + \beta_2 control_{it} + \cdots + \delta_{it} \quad (1)$$

when the control variables are described, the model can be formulated as follows.

$$elderwelf_{it} = \alpha elderwelf_{it-1} + \beta_1 urban_{it} + \beta_2 healthfac_{it} + \beta_3 lifequality_{it} + \beta_4 pov_{it} + \beta_5 lneconwelb_{it} + \beta_6 propelder_{it} + \delta_{it} \quad (2)$$

in which,

elderwelf : elderly welfare

$elderwelf_{t-1}$: *lagged* elderly welfare
healthfac : health facilities
lifequality : quality of life
pov : poverty
lneconwelb : natural logarithm of economic welfare
propelder : proportion of elderly population
δ : random *error* (noise)
i : 1-34 cross-sectional data of province
t : 1-6 time series data from 2017 to 2022

RESULTS

Descriptive Statistics

Table 2. Descriptive Statistics

Variables	N	Mean	Std. Dev.	Min	Max
elderwelf	204	86.9	3.851	73.62	95.25
urban	204	739.8	2.673	9	16.158
healthfac	204	298.2	242.9	49	1,100
lifequality	204	70.98	3.917	59.09	81.65
pov	204	7.177	3.226	2.85	17.53
econwelb	204	42,969	32.114	11.863	183.598
propelder	204	8.366	2.464	3.11	16.69

Source: Authors (data processed) (2025)

Table 2 presents an overview of interregional variations across seven research variables: elderly welfare, urbanization, health facilities, quality of life, poverty, economic welfare, and the proportion of the elderly population. The average elderly welfare (elderwelf) score of 86.9, with a standard deviation of 3.851, indicates a relatively high and evenly distributed level of welfare across regions. The urbanization (urban) variable records an average value of 739.8 with a standard deviation of 2.673, suggesting considerable disparities among provinces. The availability of health facilities (healthfac) shows a mean of 298.2 and a wide dispersion (Std. Dev. = 242.9), reflecting unequal access to healthcare services. Meanwhile, the quality-of-life (lifequality) variable has an average of 70.98 with moderate variation, indicating generally favorable living conditions. The poverty rate (pov) averages 7.18% with moderate variability, although certain regions still experience relatively high poverty levels. Economic well-being (econwelb) averages 42,969 with a large standard deviation (32,114), highlighting pronounced economic disparities between regions. The proportion of elderly individuals (propelder) averages 8.37%, ranging from 3.11% to 16.69%, suggesting that several regions are entering the early stages of an ageing society. Overall, these descriptive statistics reveal substantial interregional variations across economic, social, and demographic dimensions, which may influence elderly welfare and provide a critical foundation for subsequent inferential analysis.

Model Specification and Instrument Validity

This study employs the System GMM (Sys-GMM) estimator rather than alternative dynamic panel estimators in order to capture the dynamic relationships among variables while addressing potential endogeneity issues inherent in panel data analysis. To mitigate the risk of instrument proliferation in the System-GMM estimation, the instrument matrix was collapsed and lag depth was restricted, ensuring that the number of instruments remained below the number of cross-sectional units (N = 34). This precaution is essential in dynamic panel estimation, as an excessive number of instruments may overfit endogenous variables and weaken the reliability of specification tests.

To assess instrument validity and potential serial correlation, the Sargan test and the Arellano-Bond (AB) test were conducted (Blundell & Bond, 1998). The Sargan test yielded a value of 19.9100 with a Prob > Chi2 of 0.0975 (> 0.05), indicating that the null hypothesis of valid instruments cannot be rejected and that no evidence of over-identification is detected. Furthermore, the Arellano-Bond test for second-order serial correlation (AR(2)) produced a z-statistic of -1.5448 with a Prob > z of 0.1224 (> 0.05), suggesting the absence of second-order autocorrelation in the residuals (Table 3). These results confirm that the Sys-GMM specification satisfies key diagnostic requirements.

For robustness purposes, the Difference-GMM (Diff-GMM) estimator was also implemented. However, in the Diff-GMM specification, both the Sargan test and the Arellano-Bond test yielded significance levels below 5%, leading to rejection of the null hypotheses. This indicates the presence of over-identification problems and second-order serial correlation in the Diff-GMM model, suggesting potential instrument invalidity and estimator inconsistency. Therefore, compared to Diff-GMM, the Sys-GMM specification demonstrates superior diagnostic performance and is considered more appropriate and reliable for the panel structure used in this study. Taken together, these diagnostic outcomes support the econometric validity, consistency, and robustness of the Sys-GMM estimates reported in this analysis.

System Generalized Method of Moments Result

Table 3. Dynamics Panel Regression Result (Sys-GMM) (Short-Run)

Variables	Diff-GMM	Sys-GMM
L1.elderwelf	0.00777	0.0100
	(0.0194)	(-0.0247)
urban	-0.00078*	8.30E-05
	(0.000466)	(-0.000185)
healthfac	0.00963***	-0.00438**
	(0.00356)	(-0.00197)
lifequality	-0.01216	0.0134
	(0.01417)	(-0.00895)
pov	-0.004798	-0.0901***
	(0.03521)	(-0.0293)
lneconwelb	0.3361*	0.556***

Variables	Diff-GMM	Sys-GMM
	(0.17301)	(-0.215)
propelder	-1.4370***	-1.415***
	(0.4323)	(-0.0345)
Constant	94.003***	92.89***
	(2.917)	(-4.642)
AR (1)	-0.99994	-1.0119
	[0.3173]	[0.3116]
AR (2)	-2.0862	-1.5448
	[0.0370]	[0.1224]
Sargan Test	18.14476	19.9100
	[0.0335]	[0.0975]
Wald chi2	5718.52	5789.63
	[0.0000]	[0.0000]
Observations	136	170
Number of Prov	34	34

Source: Authors (data processed) (2025)
Note: Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Based on the results presented in Table 3, the Wald chi-square statistic is 5789.63 with a p-value of 0.0000 (< 0.005), indicating that the estimated model is statistically valid, based on a total of 170 observations. In the System-GMM (Sys-GMM) analysis, the lagged dependent variable (L1.elderwelf) was first assessed and found to have no significant effect on current elderly welfare ($p > 0.1$). Similarly, the key explanatory variable, urbanization (urban), did not exhibit a significant relationship with elderly welfare ($p > 0.1$). The control variables, however, displayed varying effects. The health facilities variable (healthfac) showed a negative and statistically significant effect on elderly welfare, with a coefficient of –0.00438 at the 5% significance level ($p < 0.05$), indicating that a one-unit increase in health facilities is associated with a 0.483% decrease in elderly welfare. In contrast, the quality of life variable (lifequality) was found to have no significant effect ($p > 0.1$). The poverty rate (pov) and the proportion of the elderly population (propelder) both exerted significant negative effects on elderly welfare, with coefficients of –0.0901 and –1.415, respectively, at the 1% significance level ($p < 0.01$). Conversely, the economic well-being variable (lneconwelb) demonstrated a positive and highly significant effect, with a coefficient of 0.556 ($p < 0.01$), implying that an increase of one thousand rupiahs in economic welfare leads to a 0.556% improvement in elderly welfare. In summary, the short-term analysis indicates that only economic well-being (lneconwelb) positively influences elderly welfare, while health facilities (healthfac), poverty (pov), and the proportion of the elderly population (propelder) exert negative effects. The Sys-GMM analysis further allows for the assessment of the long-term effects of these variables, as presented in Table 4.

Table 4. Long-Term Effects

Variables	Sys-GMM
urban	-2.89e-06
	(0.000012)
healthfac	0.000054
	(0.000172)
lifequality	0.025678
	(0.016206)
pov	-0.00195
	(0.01182)
lneconwelb	3.48e-06**
	(1.76e-06)
propelder	-1.58208***
	(0.019585)

Source: Authors (data processed) (2025)
Note: Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Based on Table 4, in the long term, the economic well-being control variable (lneconwelb) has a positive effect with a coefficient value of 3.48e-06 at a significance value of 95% (p<0.05), where this result indicates a decrease in impact compared to the short term. Furthermore, the control variable for the proportion of elderly people (propelder) has a negative effect with a coefficient value of -1.58208 at a significance level of 99% (p<0.01), indicating an increase in the negative impact of the proportion of elderly people on the welfare of the elderly in the long term. Meanwhile, the other variables did not affect the welfare of the elderly (p > 0.1).

DISCUSSION

The estimation results indicate that the lagged dependent variable of elderly welfare has no significant effect on welfare in subsequent periods. This suggests that elderly welfare in Indonesia lacks persistence over time and is primarily influenced by socio-economic fluctuations and short-term policy interventions. Variations in household economic conditions, access to public services, and family social support contribute to this dependency on current rather than past circumstances. Such findings reflect the fragile sustainability of elderly welfare in developing countries, including Indonesia, where social protection systems remain unstable.

Inadequate social protection continues to pose a major challenge across many developing contexts. Although formal ageing policies exist in most countries, many remain newly established or insufficiently implemented. For instance, Ghana's National Ageing Policy remains underfunded and ineffective (Ashirifi et al., 2022). This underscores the urgent need for comprehensive and sustainable policy frameworks that enhance access to and the effectiveness of health and social care services for older persons (Görgülü et al., 2010; Şimşek, 2025). Furthermore, integrating informal social protection mechanisms is essential to address gaps left by formal welfare systems (Mumtaz et al., 2025).

The estimation results also show that urbanization exerts a positive but statistically insignificant effect on elderly welfare. This suggests that increasing urbanization levels have not translated into improved quality of life for the elderly, as Indonesia's urbanization process remains predominantly quantitative rather than inclusive (Setiawan et al., 2017; Solana et al., 2024; Subanti et al., 2025). Consequently, elderly welfare is shaped more by socio-economic conditions and access to public services than by a region's urbanization status.

From a theoretical perspective, this finding aligns with the argument that urban growth in developing countries often prioritizes economic expansion and labor productivity rather than age-inclusive development. Urban transformation may increase aggregate income and infrastructure provision, yet it does not automatically guarantee equitable access to health services, social protection, or age-friendly environments for older adults (Montgomery, 2008). In the absence of inclusive urban planning, higher population density may even exacerbate living costs, social fragmentation, and inequality, which can disproportionately affect vulnerable groups such as the elderly. Furthermore, rapid demographic ageing without adequate institutional adaptation may intensify structural pressures on economic and welfare systems, limiting the capacity of urban areas to support older populations effectively (Skirbekk et al., 2022).Therefore, the statistical insignificance of urbanization in this study indicates that urban growth alone is insufficient; its welfare implications depend fundamentally on the inclusiveness of public policy, social protection systems, and age-responsive infrastructure.

Many healthcare facilities in Indonesia are inadequately equipped to meet the specific needs of the elderly. This insufficiency includes a lack of age-friendly infrastructure and specialized medical equipment (Aji et al., 2023; Warijan et al., 2018). The quality of healthcare services in rural areas is particularly poor due to inadequate infrastructure and limited resources (Aji et al., 2023; Bratanegara et al., 2025). Moreover, health facilities exhibit a negative association with elderly welfare, contrary to expectations that such infrastructure should enhance well-being. Although the number of health facilities in Indonesia has increased, many remain inadequately equipped and are not designed to be elderly-friendly. As noted by Suryani et al. (2023), the absence of comprehensive program evaluations—especially in community health centres—has led to misalignment between policy implementation and intended outcomes. Additionally, many program managers lack relevant qualifications and face infrastructural constraints. Studies show that health facilities equipped with lifts significantly improve elderly well-being, as ageing-related declines in joint strength elevate the risk of pain, deformity, and falls (Chen et al., 2023; Shen et al., 2022). Limited access to such facilities also restricts mobility and social participation, compelling older adults to remain at home to avoid physical strain (Chu, 2022; Yu et al., 2020). This condition has a negative impact on the physical and mental health of the elderly. Therefore, health facilities in Indonesia, especially community health centres, need to be more adaptive and elderly-friendly to support welfare environment of the elderly.

Furthermore, the estimation results show that quality of life does not significantly affect the welfare of elderly. Declining physiological function in old age leads to a decline in quality of life and limitations in carrying out daily activities. In Indonesia, the quality

of life of elderly people living in communities is commonly good, which is influenced by several factors, such as age, marital status, and morbidity levels. Health workers and caregivers has an important role in improving the quality of life of the elderly through Elderly Health Posts at the community level (Juanita et al., 2022). In line with the findings by Rondón García & Ramírez Navarrro (2018), social interaction and psychosocial factors contribute greatly to maintaining the quality of life of the elderly from a multidimensional perspective. Factors of environmental quality, use of leisure time, access to community facilities, personal autonomy, and intensity of social contact serve as complementary elements to the medical dimension that influence physical and mental health (Luthfa I. et al., 2025; Wiliyanarti, Notobroto, Hamidah, et al., 2020). A multidimensional assessment approach is important for comprehensively understanding the quality of life of the elderly, both objectively and subjectively, which ultimately contributes to improving the health and well-being of the elderly (Wen et al., 2025).

Furthermore, poverty has a negative and significant impact on the elderly welfare. These findings confirm that economic constraints directly reduce older adults' ability to meet their basic needs, such as nutritious food, healthcare, and adequate housing. In line with the Psychology of Working Theory (PWT) and Self Determination Theory (SDT), poverty has negative consequences for individual well-being by affecting their psychological condition and motivation (Fraccaroli & Barbieri, 2019). Elderly people living in poverty tend to have poorer health status, limited mobility, and low levels of social participation, which collectively reduce their quality of life (Dobarrio-Sanz et al., 2023; Thornton & Bowers, 2024). Therefore, poverty alleviation policies that focus on the elderly are crucial to ensuring equitable welfare and preventing social vulnerability in an ageing population.

The next estimation results show that economic well-being has a positive and significant effect on the elderly welfare, both in the short and long term. These findings reinforce the theory and empirical evidence that financial security becomes a major determinant of subjective well-being (SWB) in the elderly population. Economic support through stable income, savings, and pension programs enables older adults to meet their basic needs, access health services, and maintain social participation, which overall improves their quality of life (Chung et al., 2021; Ren & Duan, 2025). Consistent with studies in Taiwan and Poland, these results confirm that better income and economic conditions contribute directly to an increase in the subjective well-being of the elderly, both through financial satisfaction and decent housing quality (Chung et al., 2021; Marcinkiewicz & Chybalski, 2022; Meng & Wu, 2025). Thus, these results indicate that the economic dimension is not only a material factor but also serves as a psychological and social foundation that supports the overall well-being of the elderly.

At last, the estimation results reveal that the proportion of elderly people exerts a negative influence on their welfare in both the short and long term. This suggests that the growing number of older adults has not been accompanied by sufficient social, economic, and infrastructural preparedness to support their well-being. In the short run, the increasing elderly population intensifies pressure on already constrained healthcare, housing, and social support systems, thereby reducing access and overall quality of life. Over the long term, this trend generates an ageing burden—a structural challenge that

hampers economic growth, heightens poverty risks, and undermines the stability of social protection systems (Baranowska-Bik & Bik, 2017; Pandey et al., 2018). These results align with previous studies indicating that a rapidly increasing elderly population, when not supported by inclusive policies and environments, exacerbates risks of social isolation, mental health decline, and reduced subjective well-being (Bincy et al., 2022; Bogdon et al., 2014; Pragadesh et al., 2024). Consequently, the demographic expansion of the elderly population must be accompanied by strategic policy measures aimed at improving access to age-friendly healthcare, strengthening community-based social support, and reinforcing sustainable economic and social protection systems to safeguard long-term elderly welfare.

CONCLUSION

This study demonstrates that the welfare of elderly people in Indonesia is shaped by a complex interplay of social, economic, and demographic factors. The estimation results indicate that the lagged dependent variable of elderly welfare is insignificant, suggesting that welfare conditions among the elderly are not persistent across periods and are instead influenced by short-term socio-economic dynamics. Urbanization also shows no significant effect, although the positive relationship direction implies that rising urbanization levels have yet to translate into improved quality of life for older adults. In contrast, poverty exhibits a negative and significant impact on elderly welfare, while economic welfare exerts a positive and significant influence in both the short and long term, underscoring financial stability as a key determinant of well-being. Meanwhile, the growing proportion of elderly people negatively affects welfare, reflecting structural pressures on economic, social, and health systems. Overall, these findings highlight enhancing elderly welfare requires not only economic strengthening, but also sustainable social protection mechanisms, accessible and age-friendly healthcare services, and adequate social support systems.

Policy implications point to the need for the government to expand and strengthen social protection programs, including sustainable pension schemes and assistance coverage. Health facilities should be improved to ensure elderly-friendly design and accessibility—such as lifts and rehabilitation spaces—while urbanization policies must promote inclusive, age-sensitive urban development. Moreover, poverty reduction among older adults should be pursued through integrated, cross-sectoral strategies combining economic, health, and social dimensions. Strengthening community-based initiatives, such as Posyandu Lansia (Elderly Health Posts), is also crucial for promoting social engagement and psychosocial well-being. Long-term policy planning that integrates economic, social, and demographic aspects is also essential to anticipate and mitigate the ageing burden sustainably.

Despite its contributions, this study has several limitations. Calculating elderly welfare as 100 minus the elderly dependency ratio is too simplistic and fails to encompass important aspects such as economic contribution, health status, disabilities, and other social and economic factors. This approach is insufficient in capturing the complexity of

elderly welfare comprehensively. Therefore, using more comprehensive measures such as Elderly Age-Old Dependency Ratio (EAODR), Health Age-Old Dependency Ratio (HADR), and Age-Old Disability Dependency Ratio (ADDR) (if data is available for Indonesia) is more appropriate for understanding the needs and welfare of the elderly more accurately and in greater depth.

The variables used are limited to macro-level socio-economic indicators and may not capture psychological and micro-environmental dimensions affecting elderly welfare. Constraints in panel data coverage, both temporally and informationally, restrict the exploration of long-term dynamics. The welfare measurement relies on aggregate indicators, potentially obscuring individual and regional disparities. Methodologically, while the Generalized Method of Moments (GMM) provides efficiency in addressing endogeneity, it remains sensitive to instrument selection and the risk of instrument proliferation, which may influence test validity. Unobserved individual heterogeneity may also be underrepresented. Future research is therefore recommended to utilize microdata or longitudinal surveys, incorporate psychosocial and behavioural variables, such as family support and social participation, and employ alternative analytical techniques to produce more comprehensive and robust findings.

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