International Journal of Public Health Science (IJPHS)
Vol. 11, No. 4, December 2022, pp. 1552~1560
ISSN: 2252-8806, DOI: 10.11591/ijphs.v11i4.21752

Comparing well-being among rural and urban Indonesian older people: a quantitative analysis of the related factors

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Article Info

Article history:

Received Jan 21, 2022
Revised Aug 15, 2022
Accepted Aug 31, 2022

Keywords:

Depression
Older people
Physical capacity
Rural
Urban
Well-being

ABSTRACT

Residential area has been identified as a factor that influences the well-being of older people. This study aimed to compare the well-being of older people living in urban and rural areas in Yogyakarta province, Indonesia, and analyze the predictors of well-being. A total of 141 (79 rural and 62 urban) older people participated in this study. Well-being was assessed using the world health organization-five (WHO-5) well-being index. The factors measured included sociodemographic data (age, sex, educational level, living arrangements, and current employment status), physical function, cognitive function, depression, independence, and attitude towards aging. Data of the two groups were compared using t-tests and Chi-square analysis. Correlations with well-being were analyzed using univariate correlation and multivariate hierarchical regression. The urban group had slightly older age, higher education, lower mobility and balance, higher attitude scores, and higher well-being. Depression was a significant variable in well-being for both communities. Physical capacity was an important factor in urban populations, while well-being in rural areas was better predicted by independence and cognitive function. The results suggest that there are similar and different correlates of the well-being of rural and urban older people, recommending different programs to enhance the well-being of older people living in different areas.

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1. INTRODUCTION

With over 25 million people aged 60 years and over in 2020, Indonesia has the fourth highest population of older people in the world [1]. Currently comprising 10.7% of the population, this number is expected to grow to over twice its size in 25 years, with a prediction of 60 million older people (19.9%) in 2045. The highest percentage of older people is found in Yogyakarta province (15.52%), which also has the longest average lifespan in Indonesia.

This aging population makes it inevitable for Indonesian government to pay more attention to the quality of life of its older people. World health organization (WHO) defines quality of life as a person's perception of their position in life, considering their expectations, concerns, and the culture that they live in [2]. Ensuring good quality of life for older people will reduce disease burden as well as boost

productivity. Higher quality of life is associated with higher independence, less risk of falls, and lower morbidity and mortality in the elderly [3].

Quality of life is a multidimensional function with multiple domains, such as the physical, psychological, social, family, and environmental domains. Various factors affect quality of life, including age, gender, physical health, mental health, independence, economic status, and social relationships [4]. Mental well-being is one of the less-studied aspects of the quality of life. Elderly people are at risk for decreased well-being due to declining physical capacity and changing socioeconomic situations. Studies suggest that psychological well-being may act as a protective factor for health in general [5], [6]. Lower well-being among older people has been correlated with lower health and higher mortality, independent from demographic factors and physical health [7].

Different residential areas also influence well-being of older people, but the effect varies among countries. Asian studies found that rural older people tend to have poorer well-being compared to their urban counterparts [8], [9]. Findings from European studies vary: some reported higher well-being for urban settings [10], while others reported higher well-being in rural areas [11]-[13].

Rural and urban older people also vary in predictors for well-being. Several studies from China observed that physical and cognitive health were more important factors for rural older adults, while activities of daily living (ADL) and socioeconomic factors played a greater role for urban dwellers [14], [15]. A study in Poland reported that education had a greater impact on rural people's health, while social network was more important for urban people [12]. Another study from Spain reported that health affects well-being differently in urban and rural settings [13]. Very few studies on the situation of rural and urban older adults have been done in South-East Asia [16], [17].

Most of the currently available studies comparing rural and urban older adults in Indonesian focus on socio-culture or physical health issues [18], [19]. To our knowledge, there has been no published study that compared the well-being nor well-being determinants between rural and urban community-dwelling older people in Indonesia. This study aimed to compare the well-being and health of older people living in urban and rural areas in Yogyakarta province, Indonesia, as well as analyse the predictors of well-being. With information on the factors of well-being in each residential area type, better intervention programs and policies can be designed and implemented to improve the quality of life for both rural and urban older people.

2. RESEARCH METHOD

Community-dwelling older people of Yogyakarta province, Indonesia participated in this cross-sectional study. Yogyakarta province has one Municipality and four regencies. Sampling was done from the three regions with the highest percentage of older people: Yogyakarta Municipality, Sleman Regency, and Gunungkidul Regency [20]. Based on the classification from the Indonesian bureau of statistics, Yogyakarta Municipality is classified as urban, Sleman Regency has urban and rural areas, while the remaining three districts are mostly rural. Yogyakarta Municipality and the urban areas of the Sleman Regency were chosen for the urban areas, while Gunungkidul Regency was chosen for the rural subjects.

The inclusion criteria for study subjects were community-dwelling older people aged 60 years and above who lived in one of the selected areas. The selection of subjects was done using consecutive sampling. The world health organization-five (WHO-5) well-being index was used to measure well-being [21]. WHO-5 is a global rating scale for measuring subjective well-being, which correlates well with mental-related and overall quality of life in older adults. The total raw scores ranged from 0-25, which were then transformed into scores of 0-100 by multiplying the raw score by 4.

The sociodemographic information obtained included age, sex, educational level, living arrangements, and current employment status. Physical function was assessed for mobility and balance. Mobility was assessed using the timed get-up-and-go test (TUG), while the berg balance scale (BBS) was used as a measure of balance. Cognitive function was observed using the mini-mental state examination (MMSE) and depression using the center for epidemiologic studies depression (CESD) questionnaire. Independence was measured using the Katz Index of independence in ADL and the lawton instrumental activities of daily living (IADL) Scale. the attitudes to aging questionnaire (AAQ) was used to assess attitudes towards aging [22]. Data were obtained through face-to-face interviews.

The results of the urban and rural groups were compared using t-tests (for continuous variables) and chi-square (for categorical variables). Bivariate correlations between well-being and the other variables were determined using the Spearman product correlation coefficient. Comparison of the relative contributions of each variable was then done using hierarchical multiple linear regression with well-being as the dependent variable. In this method, predictors were added to the model in blocks to compare the contribution of each block. Data collection for this study started after an ethical clearance no. 1l33/c.l6/EK/2020 was obtained from the ethics committee of faculty of medicine, Duta Wacana Christian University.

3. RESULTS AND DISCUSSION

Overall, 141 older people aged 60-75 years (66.50±4.82 years participated in this study. There were 79 (39 men and 40 women) participants living in urban areas, and 62 (30 men and 32 women) residing in rural areas. Table 1 compares the characteristics of the urban and rural groups. The urban group was slightly older and had higher education compared to the rural group. Urban participants had significantly lower physical capacity (longer TUG and lower balance), higher attitude scores, and higher well-being. Differences in cognitive function, depression, ADL, and IADL were not significant statistically.

Table 1. Characteristics of the rural and urban respondents

	Urban (n=62)	Rural (n=79)	p-value
Age (mean±standard deviation (SD))	67.44±4.46	65.77±5.00	0.042*
Sex (n (%))			
Male	30 (48.39%)	39 (49.37%)	0.908
Female	32 (51.61%)	40 (50.63%)	
Educational level (n (%))			
Did not go to school	5 (8.06%)	4 (5.06%)	
Did not finish elementary school	8 (12.90%)	19 (24.05%)	
Elementary school	7 (11.29%)	18 (22.78%)	0.000**
Junior high school	7 (11.29%)	14 (17.72%)	
Senior high school	14 (22.58%)	21 (26.58%)	
University diploma/degree	21 (33.87%)	3 (3.80%)	
TUG (seconds) (mean±SD)	13.47±3.23	10.41±1.66	0.000**
Balance Score (mean±SD)	50.13±6.97	54.05±4.88	0.000**
Mental function (mean±SD)	26.06±4.88	27.03±3.51	0.176
Depression (mean±SD)	4.85±2.82	5.06±2.28	0.628
ADL (mean±SD)	19.65±1.06	19.90±0.38	0.076
IADL (mean±SD)	13.69±3.19	14.41±1.63	0.113
AAQ (mean±SD)	95.95±10.61	88.34±6.89	0.000**
Well-being (mean±SD)	92.06±11.82	84.66±17.07	0.003**

(*p<0.05, **p<0.01)

Table 2 shows the Spearman correlations between the measured parameters and well-being. When analysed for all participants, higher well-being was correlated with higher balance, lower depression, higher attitude, and urban residential area. When compared separately, the urban population, higher mobility (as shown by shorter TUG) was the only factor that correlated significantly with higher well-being. For the rural respondents, higher well-being was associated with higher cognitive function, lower depression, higher ADL and IADL, and higher attitude scores.

Table 2. Spearman correlations between health parameters and well-being

Parameters	Overall (n=141)	p-value	Urban (n=62)	p-value	Rural (n=79)	p-value
Age	-0.005	0.958	-0.151	0.241	-0.015	0.895
Gender	0.098	0.247	0.027	0.833	0.134	0.240
Education	-0.017	0.839	-0.118	0.360	-0.061	0.595
TUG	-0.014	0.865	-0.295	0.020*	-0.118	0.300
Balance	-0.180*	0.033	-0.006	0.960	-0.140	0.220
Cognitive function	0.080	0.348	-0.490	0.705	0.242	0.032*
Depression	-0.338**	0.000	-0.210	0.101	-0.518	0.000**
ADL	0.071	0.405	-0.051	0.696	0.225	0.047*
IADL	0.132	0.120	-0.034	0.791	0.486	0.000**
AAQ	0.409**	0.000	0.183	0.155	0.410	0.000**
Residential area (urban=0, rural=1)	-0.258**	0.002	-	-	-	-

(*p<0.05, **p<0.01)

Analysis of the contributions of each factor towards well-being was analysed using hierarchical regression. The hierarchical regression was done in seven blocks: i) Sociodemographic characteristics (age, sex, education); ii) Physical function (TUG, BBS); iii) Cognitive function (MMSE); iv) Depression (CESD); v) Independence (ADL and IADL); vi) Attitude towards aging (AAQ); and vii) Residential area (rural or urban). Table 3 shows the results of hierarchical linear regression models on well-being for all subjects. Overall, the measured variables accounted for 30.5% variance of well-being. Sociodemographic

characteristics contributed 0.9%. Addition of physical capacity explained an additional 3.3% of variance. When cognitive function was included, it only explained 1.8% variance. Depression contributed most to the variance, explaining 14.1%. Independence only added 2.1% variance. In step 6, 5.3% of variance was explained by attitude towards aging. Inclusion of residential area explained an added 3% of the variance.

Table 3. Hierarchical linear regression models for predicting well-being for all subjects

Parameters	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
Age	-0.017	-0.112	-0.029	-0.110	-0.078	-0.094	0.014
Gender	2.885	3.242	3.547	1.040	0.890	0.261	-0.089
Education	0.008	0.513	-0.300	-0.469	-0.974	-1.360	-2.129*
TUG		-0.452	-0.273	-0.283	-0.159	-0.370	-0.874
Balance		-0.514*	-0.581*	-0.658**	-0.709**	-0.602*	-0.514*
Cognitive function			0.639	0.226	0.179	0.073	0.190
Depression				-2.458**	-2.300**	-1.909**	-1.859**
ADL					-2.763	-3.027	-2.585
IADL					1.243	1.027	1.175
AAQ						0.426**	0.296*
Residence							-7.497*
Constant	84.632**	120.724**	102.269**	139.431**	178.296**	148.743**	148.310**
F value	0.412	2.341	2.634	23.435**	1.734	9.523**	5.585*
R^2 (adjusted)	0.009	0.042	0.061	0.201	0.222	0.275	0.305
	(-0.013)	(0.007)	(0.019)	(0.159)	(0.169)	(0.219)	(0.246)
R^2 change	0.009	0.033	0.018	0.141	0.021	0.053	0.030

(*p<0.05, **p<0.01)

The greatest change in R2 happened when the depression variable was added (R2 change=14.1%), followed by the addition of the attitude variable (5.3%), and the physical capacity component (3.3%). The variables that independently and significantly contributed to well-being were education, balance, depression, attitude, and residential area. The incorporation of residential area type in the last model only contributed 3.0%, although it was statistically significant.

Table 4 summarises the results of hierarchical regression for the urban group. For the urban group, the variables assessed explained 24.2% of the variance. At step 1, sociodemographic factors accounted for 3.8%. Physical capacity contributed most significantly, contributing 8.0%. Addition of cognitive function did not affect the model significantly, contributing only 0.1%. Depression explained 6.2% of the variance. Independence accounted an additional 2.8%. In step 6, 5.3% of variance was explained by attitude towards aging.

Table 4. Hierarchical linear regression models for predicting well-being for urban older people

Parameters	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Age	-0.407	-0.153	-0.180	-0.152	-0.121	-0.151
Gender	-0.015	-0.411	-0.425	-1.694	-1.009	-1.776
Education	-0.844	-1.268	-1.096	-1.633	-1.328	-1.178
TUG		-1.093*	-1.096*	-1.037*	-1.137*	-1.140*
Balance		0.053	0.052	-0.047	0.118	0.139
Cognitive function			-0.087	-0.109	0.006	-0.116
Depression				-1.202*	-1.543*	-1.388*
ADL					-1.274	-1.465
IADL					-0.707	-0.846
AAQ						0.229
Constant	123.181**	120.469**	123.940**	136.872**	158.921**	146.509**
F value	0.754	2.545	0.036	4.117*	0.931	2.215
R^2 (adjusted)	0.038	0.118	0.118	0.181	0.209	0.242
	(-0.012)	(0.039)	(0.022)	(0.075)	(0.072)	(0.093)
R^2 change	0.038	0.080	0.001	0.062	0.028	0.033

(*p<0.05, **p<0.01)

The greatest R2 change occurred with the inclusion of the physical capacity component (R2 change: 8.0%), followed by depression (6.2%), and the sociodemographic characteristics (3.8%). After all variables were included, the significant predictors were TUG and depression. The hierarchical linear regression model for the rural group is presented in Table 5. Nearly half (45.7%) of variance was explained by the measured variables. Basic demographic factors contributed to 1.9% of the variance. Inclusion of physical capacity explains an additional 6.9% variance. Cognitive function contributed 7.9% to variance. Depression accounted

for 15.0% of the variance. Independence contributed 11.5% of variance. Inclusion of attitude in step 6 only contributed minimally, adding 2.6% of variance. Depression accounted for the largest R^2 change (15.0%), followed by independence (11.5%), and cognitive function (7.9%). The variables that were proved significant were depression and IADL.

Table 5. Hierarchical linear regression models for predicting well-being for rural older people

Parameters	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Age	0.019	0.301	0.196	0.043	0.131	0.026
Gender	4.324	4.275	5.465	2.478	1.810	2.648
Education	-0.465	-0.909	-2.210	-0.858	-2.025	-2.254
TUG		-2.828	-1.251	-1.155	-0.459	-0.018
Balance		-0.899*	-0.981*	-0.723	-0.644	-0.584
Cognitive function			1.647*	0.730	-0.283	-0.246
Depression				-3.244**	-2.429**	-1.984*
ADL					4.959	3.455
IADL					4.422**	4.187**
AAQ						0.473
Constant	78.515**	139.592**	92.767*	128.866**	-22.498	-35.822
F value	0.489	2.759	6.782**	15.540**	6.953**	3.246
R^2 (adjusted)	0.019	0.088	0.167	0.316	0.431	0.457
	(-0.020)	(0.026)	(0.097)	(0.249)	(0.357)	(0.377)
R^2 change	0.019	0.069	0.078	0.150	0.115	0.026

(*p<0.05, **p<0.01)

3.1. Discussion

This study compared well-being and the associated factors among older people living in urban and rural areas in Yogyakarta province, Indonesia. The urban group had slightly older ages, higher education, lower mobility and balance, higher attitude scores, and higher well-being compared to their rural counterparts. Depression played a significant role in well-being for both communities, but other factors differed for urban and rural inhabitants. Physical capacity was an important factor in urban populations, while well-being in rural areas was better predicted by independence and cognitive function.

3.1.1. Rural-urban comparisons

The lower physical capacity found in the urban group is similar to the findings of a study, that reported slower gait in Yogyakarta urban older people compared to their rural counterparts [23]. Studies from Asia and Africa show lower physical function in urban people [24], [25]. Meanwhile, American and European rural older adults have lower physical function compared to urban people [26], [27]. In general, developing countries show higher physical capacity in rural inhabitants, while developed countries report the opposite.

One possible mediating factor in this rural-urban difference in physical capacity is physical activity. Physical activity improves physical capacity and protects from disability in the aging years [28]. Studies from Asia and Africa report that rural inhabitants often have higher physical activity, especially related to work [25], [29]. Meanwhile, studies from America and Europe report that physical activity tends to increase with urbanicity [26], [27]. These findings correlate with the higher physical capacity in rural older people in developing countries and urban older people in developed countries.

The higher attitude scores among urban older people resemble the findings of Hou *et al.* [30]. Various environmental factors can affect perception of and attitudes towards the aging process, including education levels, economic status, and functional independence [31]–[33]. In this study, urban participants had higher education levels. Rural Asians also tend to have lower socioeconomic status [34]. The higher education and socioeconomic status among the urban older Indonesian people may partially explain the higher well-being found.

Urban older people had higher well-being compared to the rural group in this study. In the last step of the hierarchical regression, the residential area was a significant variable in well-being, which indicates that rural-urban differences still affect well-being independently from the variables measured. This result is similar to findings from other countries in Asia and several European countries [8], [10], [12], [35].

The higher well-being could result from the higher attitude scores found in the urban subjects. People who perceive the aging process positively tend to maintain hope and motivation to improve their well-being. Attitude towards aging has been reported as a positive predictive factor well-being [36]. Education has also been reported as a positive predictive factor for well-being [37]. The combination of these two factors may partially explain the higher well-being found in urban older people.

Other factors that may play a role in the difference in well-being are higher education, higher socioeconomic status, and higher availability of services in urban settings. Education and economic independence have been reported to be factors related to well-being [37], [38]. There are fewer healthcare services available in Gunungkidul Regency compared to Yogyakarta Municipality and Sleman Regency, which may contribute to the lower well-being [20].

3.1.2. Differing factors in well-being for urban and rural subjects

From bivariate correlations and hierarchical regression for all subjects, well-being was correlated with higher education, higher balance, lower depression, higher attitude scores, and urban residential areas. These findings are consistent with previous studies [39], [40]. Separate analysis for the urban and rural groups resulted in several different factors for well-being. Depression was a significant factor in both groups, while physical capacity was only significant for the urban group. In the rural group, independence, cognitive function, and attitude were also significant factors.

Depression was a particularly important factor for both urban and rural participants. Studies, both from developed and developing countries, have reported depression as a significant predictor for lower wellbeing [39], [41]. Depression has also been associated with more functional disability and chronic medical comorbidities [39], [40].

The higher importance of physical health for the urban group may stem from the lower physical capacity found in the urban older people. Quality of life will plateau over the normal range of physical capacity and starts dropping when a certain threshold is passed [42]. With more limited physical capacity, urban older people may be nearer to the threshold, which would explain the stronger correlation between physical capacity and well-being. This result also supports a study from China that demonstrated that increased physical activity was associated with improved functional capacity and less depression in urban participants only [43].

Well-being among rural older people was also correlated with independence and cognitive function. This finding may be due to the higher percentage of working older people in rural areas compared to urban areas [1]. People who still need to work for their living will need their independence and cognitive function. Another Asian study demonstrated that cognitive function was a significant predictor for unmet needs among rural older people, but not for urban older people [15]. Houses and places in rural areas tend to be farther set apart compared to urban areas, needing longer commute and higher independence. These results highlight the higher importance for independence and cognitive function for rural Asian older adults, as compared to the urban population.

3.1.3. Implications for public health programs

Greater disparities in well-being and health exist between rural and urban older people in developing countries. The related factors can also differ between settings, showing different priority targets. Thus, these countries need to adjust policymaking and program planning to the type of residential area.

As a common factor in both settings, depression must be screened for in all older populations. Mitigating depression in elderly people can simply be done by holding routine group meetings, along with programs for other aspects. By increasing social interaction, routine meetings can help alleviate loneliness and depression [44].

Given the lower physical capacity in urban older people, developing countries need to take more care in screening for physical frailty in urban groups. Urban elderly people may also need more programs to increase physical activity, such as by providing facilities and routine exercise groups. A study in China showed that increasing physical activity produced greater functional improvement in urban compared to rural elderly people [43].

Meanwhile, cognitive function and independence play greater roles in the well-being of rural older people living in developing countries. Therefore, group meetings in rural areas could involve more activities that stimulate the mind, such as playing games or doing house chores (like cooking) together. As an example, a town in Japan launched "community salons", which provided senior residents a place to meet and participate in various activities, including games and crafts [45]. After five years, the participants were half as likely to become disabled compared to non-participants.

3.1.4. Study limitations

This study was done with a cross-sectional design, which means that we could not ascertain the causality between the parameters. Another limitation in our study is that social factors have not been measured, such as economic status and loneliness. The results may also vary in other areas in Indonesia, which is a vast and highly heterogeneous country, and other countries in Asia. Further studies are needed to clarify the role of other factors in the well-being of rural and urban older people in other developing countries.

4. CONCLUSION

Urban Indonesian older people have lower mobility and balance, higher attitude scores, and higher well-being compared to their rural counterparts. Higher education and attitudes to aging may contribute to the higher well-being of the urban population. Depression is a significant factor for both urban and rural inhabitants. Well-being was associated with physical capacity only in urban older adults. Other predictors for well-being in rural older people include cognitive function, independence, and attitude to aging. Public health policymaking and program planning need to consider these differences to optimise well-being and health for both urban and rural older people.

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