

**FULL PAPER**

# Analysis of biopsychosociospiritual factors affecting loneliness in the elderly in Surabaya City

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Physical, cognitive, and psychosocial changes in the aging process in the elderly can increase the risk of loneliness. Loneliness is a cause of physical and mental health problems in the elderly, such as depression, suicidal ideation, sleep disorders, cognitive decline, emotional disorders, and others. Paying attention to risk factors that affect it is one of the efforts to prevent loneliness. Therefore, it is necessary to analyze the factors that affect it in an effort to create psychological well-being. This study analyzes biopsychosociospiritual factors that affect loneliness in the elderly in Surabaya City. This study is an observational analytic quantitative study with a cross-sectional design approach. This study was conducted on the elderly population in Surabaya City. The used sampling technique was multistage random sampling. Data were collected using demographic questionnaires, Barthel Index, Numeric Rating Scale, Ten-Item Personality Inventory, Depression Anxiety and Stress Scales, APGAR Family Questionnaire, Multidimensional Scale of Perceived Social Support, Malay Spiritual Well-being Scale, and dan University of California Los Angeles Loneliness Scale. Biopsychosociospiritual factors that affect loneliness in the elderly in Surabaya City based on the results of bivariate analysis of Chi-square test are multimorbidity, pain, education, social groups, and social support. The results of multivariate logistic regression analysis show that multimorbidity and social support influence loneliness in the elderly in Surabaya City. Multimorbidity, pain, education, social groups, and social support influence loneliness in the elderly in Surabaya City.

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**KEYWORDS**

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**Introduction**

The number of elderly people continues to increase along with progress in the health section, which is marked by an increase in life expectancy and a decrease in death rates. This demographic development can have impacts in the health, economic and social fields [1]. Most

elderly people have the loss of a partner or close friend, job, and ability to do activities, a decrease in income, physical and cognitive function, as well as an increase in illness, disability, and loneliness [2-4].

Loneliness is a subjective feeling of discomfort that does not match what is expected and what is obtained [5] in the form

of a lack or loss of relationships and frequency of contact quantitatively and/or emotional (intimacy) qualitatively [6]. Loneliness can reduce psychological well-being [7].

Loneliness has a negative impact on physical [8] and mental health [9-13].

The risk factor for loneliness is elderly people aged > 65 years, female, unmarried, divorced, living alone, low income, low education, migrants, abnormalities in the structure and biology of the brain, genetics, employment, poor physical, mental, and cognitive health [14]. Other psychosocial factors that can affect loneliness are the quantity of social networks, the quality of social networks, and low environmental support [15-19]. Spiritual factors can also affect loneliness [20].

There is no special program carried out by the government to overcome loneliness in Indonesia. There is no research regarding loneliness in the elderly in the city of Surabaya, even though East Java is the province with the second highest population of elderly people in Indonesia and Surabaya is the only city in the province of East Java that has a Psychiatry Specialist Medical Education program. Accordingly, researchers are interested in conducting research analyzing Biopsychosociospiritual factors that affect loneliness in Surabaya City.

## Experimental

This type of study is observational analytical with a cross sectional. This research was carried out in 20 areas spread across Surabaya

City in July until October, 2023. Research permission from the Research Ethics Committee of the Faculty of Medicine, Universitas Airlangga. Samples were taken using multistage random sampling, namely a combination of cluster sampling methods to determine the sampling area and simple random sampling to determine respondents. The subjects in this study were elderly people who met the inclusion and exclusion criteria and filled out the questionnaire directly, totaling 168 respondents. The inclusion criteria are: (i) Elderly aged 60 years and over; (ii) living in Surabaya City for more than 1 year; (iii) Can communicate in Indonesian; (iv) agree to participate in research; (v) cooperative and communicative; (vi) there was no cognitive impairment as indicated by an Abbreviated Mental Test (AMT) score of 8-10; (vii) no psychosis was found during the Mini International Neuropsychiatric Interview examination. The exclusion criteria were that respondents did not answer the questions completely.

Data processing in this study was carried out using the SPSS 24.0 application and Microsoft Excel for Windows. The data that has been collected is then analyzed univariately, bivariately, and multivariately.

## Results and discussion

### Univariate analysis

The results of univariate analysis are presented in Table 1.

**TABLE 1** Demographic characteristics of research subjects

No.	Variable	Category	Frequency	%
<b>Dependent Variable</b>				
1.	Loneliness	Not lonely	59	35,1
		Lonely:	109	64,9
		- Mild loneliness	74	44,0
		- Moderate loneliness	28	16,7
		- High loneliness	7	4,2
<b>Independent Variable</b>				
1.	Gender	Men	23	13,7

		Women	145	86,3
2.	Age (year)	60-69	111	66,1
		70-79	49	29,2
		80-89	8	4,8
	Mean ± Standard deviation			67,86 ± 5,58
3.	Sensory impairment	No sensory impairment	60	35,7
		Sensory impairment:	108	64,3
		- Visual impairment	93	55,4
		- Hearing impairment	8	4,8
		- Visual and hearing impairment	7	4,2
4.	Multimorbidity	None	106	63,1%
		Morbidity:	62	36,9
		- Hypertension	50	23,6
		- Diabetes mellitus	21	9,9
		- Heart disease	11	5,2
		- Arthritis	60	28,3
		- Stroke	2	0,9
		- Asthma	5	2,4
		- Hyperuricemia	22	10,4
		- Gastritis	7	3,3
		- Vertigo	4	1,9
		- Insomnia	2	0,9
		- Others	28	13,2
5.	Mobility impairment and risk of falls	Independent	135	80,4
		Dependent:	33	19,6
		- Mild dependency	18	10,7
		- Moderate dependency	14	8,3
		- High dependency	1	0,6
6.	Pain	Not pain	51	30,4
		Pain:	117	69,6
		- Mild pain	37	22,0
		- Moderate pain	68	40,5
		- Severe pain	12	7,1
7.	Marital status	Single:	99	58,9
		- Unmarried	3	1,8
		- Divorced	2	1,2
		- Widowed	94	56,0
		Married	69	41,1
		- Married and living together	66	39,3
		- Married and living separately	3	1,8
8.	Living together status	Living alone	15	8,9
		Living with nuclear family	117	69,6
		Living with 3 generations	32	19,0
		Living with other family or other person	4	2,4
9.	Life role	Working	9	5,4
		Taking care of the house or caring for people	90	53,6
		Working and taking care of the house or caring for people	53	31,5
		Unemployment	16	9,5
10.	Income	≤ IDR 2,000,000	134	79,8
		> IDR 2,000,000	34	20,2
11.	Education	Low education	103	61,3
		High education	65	38,7
12.	Migrant status	Native	106	63,1
		Immigrant > 5 years old	61	36,3
		Immigrant < 5 years old	1	6

13.	Personality	Extraversion	8	4.8
		Agreeableness	49	29.2
		Conscientiousness	12	7.1
		Emotional stability	12	7.1
		Openness	14	8.3
14.	Mental disorder	Mixed	73	43.5
		Unstress	159	94.6
		Stress:	9	5.4
		- Mild stress	6	3.6
		- Moderate stress	2	1.2
		- Severe stress	1	0.6
		Not anxious:	159	94.6
		Anxious:	9	5.4
		- Mild anxious	7	4.2
		- Moderate anxious	1	0.6
		- Severe anxious	1	0.6
		Not depression	162	96.4
		Depression:	6	3.6
- Mild depression	2	1.2		
- Moderate depression	1	0.6		
- Severe depression	3	1.8		
15.	Family function	Family dysfunction:	48	28.5
		- Unhealthy family	11	6.5
		- Moderate family dysfunction	37	22.0
16.	Social group	Good family function	120	71.4
		1. Social group	158	94.0
17.	Social support	2. No social group	10	6.0
		1. Mild	28	16.7
		2. Moderate	60	35.7
18.	Spiritual	3. High	80	47.6
		1. Moderate	17	10.1
		2. High	151	89.9

The proportion of elderly women in Indonesia is also higher than men, namely 52.28% in 2023 based on the Badan Pusat Statistik [21]. The proportion of elderly women in Surabaya is higher than men, namely 52.78% in 2021 based on Badan Kependudukan dan Keluarga Berencana Nasional [22].

Rheumatoid arthritis is a common condition among older adults that can significantly affect mobility and independence [23]. The number of independent elderly people in mobility in Southeast Asian countries is relatively low due to chronic diseases, lack of physical activity, and poor nutrition [24]. Other factors are associated with mobility and fall risk, such as female gender, multimorbidity, and malnutrition [25-26].

62.62% of elderly people in the city of

Surabaya are married, 30.85% are widowed, 3.34% are unmarried, and 3.2% are divorced [22]. Several research subjects were found to have chosen to live alone apart from their children and in-laws due to personality incompatibility to avoid conflict, but still had good relations with their neighbors.

Saito and Izawa's (2021) research on elderly people in China found that extraversion tends to decrease with age. Another study of elderly people in Malaysia found that extraversion and neuroticism decreased with age, while agreeableness and conscientiousness remained relatively stable [24].

Prevalence of anxiety and mood disorders others are expected to increase as the proportion of elderly people increases [27]. A study in China found that approximately 60%

of elderly people with depression were at risk of suicide [28]. A study in the Babadan Community Health Center working area found that the majority of elderly people had good family function, resulting in a good quality of life [29]. Involvement in the community can contribute to a sense of belonging and the ability to help others [15].

The spirituality level in the elderly is dominated by a high level of spirituality

(85.2%). This condition because the elderly get closer to God [30]. A German study revealed the potential for spirituality to influence health-related behavior [31].

#### Bivariate analysis

The results of bivariate analysis using the Chi-Square test are summarized in Table 2.

**TABLE 2** Bivariate analysis using the Chi-Square test

No.	Variable	Category	Not lonely n (%)	Lonely n (%)	Total n (%)	P-value
1.	Sex	Men	9 (39.1%)	14 (60.9%)	23 (100%)	0.842
		Women	50 (34.5%)	95 (65.5%)	145 (100%)	
2.	Age (year)	60-69	44 (39.6%)	67 (60.4%)	111 (100%)	0.179
		70-79	12 (24.5%)	37 (75.5%)	49 (100%)	
		≥ 80	3 (37.5%)	5 (62.5%)	8 (100%)	
3.	Sensory impairment	No sensory impairment	21 (35%)	39 (65%)	60 (100%)	0.587
		Visual impairment	34 (36.6%)	59 (63.4%)	93 (100%)	
		Hearing impairment	1 (12.5%)	7 (87.5%)	8 (100%)	
		Visual and hearing impairment	3 (42.9%)	4 (57.1%)	7 (100%)	
4.	Multimorbidity	No multimorbidity	44 (41.5%)	62 (58.5%)	106 (100%)	0.036
		Multimorbidity	15 (24.2%)	47 (75.8%)	62 (100%)	
5.	Impaired mobility and risk of falls	Independent	51 (37.8%)	84 (62.2%)	135 (100%)	0.209
		Dependent	8 (24.2%)	25 (75.8%)	33 (100%)	
6.	Pain	Not pain	24 (47.1%)	27 (52.9%)	51 (100%)	0.049
		Pain	35 (29.9%)	82 (70.1%)	37 (100%)	
7.	Marital status	Single	31 (31.3%)	68 (68.7%)	99 (100%)	0,283
		Married	28 (40.6%)	41 (59.4%)	69 (100%)	
8.	Living together status	Alone	2 (13.3%)	13 (86.7%)	15 (100%)	0,269
		Nuclear family	43 (36.8%)	74 (63.2%)	117 (100%)	
		3 generations	13 (40.6%)	19 (59.4%)	32 (100%)	
		Other family/people	1 (25%)	3 (75%)	4 (100%)	
9.	Life role	Working	5 (55.6%)	4 (44.4%)	9 (100%)	0,366
		Taking care of the house or caring for people	29 (32.2%)	61 (67.8%)	90 (100%)	
		Working and taking care of the house or caring for people	21 (39.6%)	32 (60.4%)	53 (100%)	
		Unemployment	4 (25%)	12 (75%)	16 (100%)	
10.	Income	≤ IDR 2,000,000	43 (32.1%)	91 (67.9%)	134 (100%)	0,152
		> IDR 2,000,000	16 (47%)	18 (53%)	34 (100%)	
11.	Education	Low	28 (27.2%)	75 (72.8%)	103 (100%)	0,011
		High	31 (47.7%)	34 (52.3%)	65 (100%)	
12.	Migrant status	Native	41 (38.7%)	65 (61.3%)	106(100%)	0,273
		Immigrant >5 years old	18 (29.5%)	43 (70.5%)	61 (100%)	
		Immigrant <5 years old	0 (0%)	1 (100%)	1 (100%)	
13.	Personality	Extraversion	1 (12.5%)	7 (87.5%)	8 (100%)	0,218
		Agreeableness	14 (28.6%)	35 (71.4%)	49 (100%)	
		Conscientiousness	2 (16.7%)	10 (83.3%)	12 (100%)	
		Emotional stability	5 (41.7%)	7 (58.3%)	12 (100%)	

No.	Variable	Category	Not lonely n (%)	Lonely n (%)	Total n (%)	P- value
		Openness	7 (50%)	7 (50%)	14 (100%)	
		Mixed	30 (41%)	43 (58%)	73 (100%)	
14.	Mental disorder	Not stressed	55 (34.6%)	104 (65.4%)	159 (100%)	0,218
		Stressed	4 (44.4%)	5 (55.6%)	9 (100%)	
		Not anxious	57 (35.8%)	102 (64.2%)	159 (100%)	
		Anxious	2 (22.2%)	7 (77.8%)	9 (100%)	
		Not depressed	58 (35.8%)	104 (64.2%)	162 (100%)	
		Depressed	1 (16.7%)	5 (83.3%)	6 (100%)	
15.	Family function	Family disfunction	11 (22.9%)	37 (77.1%)	48 (100%)	0,055
		Good family function	48 (40%)	72 (60%)	120 (100%)	
16.	Social group	Have social group	59 (37.3%)	99 (62.7%)	158 (100%)	0,015
		No social group	0 (0%)	10 (100%)	10 (100%)	
17.	Social support	Low	3 (10.7%)	25 (89.3%)	28 (100%)	0,003
		Moderate	19 (31.7%)	41 (68.3%)	60 (100%)	
		High	37 (46.3%)	43 (53.7%)	80 (100%)	
18.	Spiritual	Low	0 (0%)	0 (0%)	0 (0%)	1,000
		Moderate	6 (35.3%)	11 (64.7%)	17 (100%)	
		High	53 (35.1%)	98 (64.9%)	151 (100%)	

Based on the results, it can be seen that loneliness is more common in women, namely 65.5%, compared to men, namely (60.9%). Loneliness levels are higher in older compared to younger seniors due to lower income, functional limitations, higher rates of singleness [32], retirement, reduced social interaction, and loss of loved ones [33].

A study on the quality of life found that the majority of working seniors reported satisfaction with their quality of life, which in turn could contribute to reducing loneliness [34]. Research conducted in Bali found that the majority of elderly respondents who earned less than IDR 500,000 experienced stress and loneliness, and this was positively correlated with depression [35]. Research by Sanjeed and Manjuvani (2023) states that low levels of education have a high average loneliness score [36].

Migrant status can increase loneliness and social isolation due to several factors such as language barriers, cultural differences, and lack of social support networks [37], unless immigrants are able to adapt because the previous area still has a culture that tends to be the same [38].

Chi-Square test results show that there is no significant relationship between loneliness and gender, age, sensory impairment, mobility

impairment and risk of falls, marital status, cohabitation status, life roles, income, citizen status, personality, family function, and mental disorders in elderly in Surabaya ( $p > 0.05$ ). The meaningfulness of several variables resulting from this research is due to several reasons, namely the same general factors that cause loneliness [39], different research limitations, having other supporting factors that reduce loneliness, or the research results are less specific.

Chi-Square test results show that there is a significant relationship between loneliness and multimorbidity, pain, education, social groups, and social support with loneliness in the elderly in Surabaya ( $p < 0.05$ ). The strength of the relationship between multimorbidity, pain and social groups with loneliness obtained a contingency coefficient of 0.172; 0.163; 0.182 which shows the strength of the relationship is very weak. The strength of the relationship between education and social support and loneliness obtained a contingency coefficient of 0.205; 0.258 which indicates the strength of the relationship is weak.

Individuals who have multimorbidity are at risk of experiencing loneliness, because they leave work thereby reducing daily contact with coworkers [15].

Multimorbidity can limit the ability of older

adults to engage in social activities, leading to increased loneliness. The psychological impact of declining health and functional limitations can worsen loneliness [41-42]. The prevalence of pain in the elderly is high because it is associated with chronic comorbid diseases. Pain can limit physical activity and social participation, resulting in loneliness [43]. Research conducted by Simões, Amaral, and Rocha (2021) found that loneliness is related to chronic pain in the elderly [41].

Sanjeed and Manjivani (2023) argued that a low level of education has a high average loneliness score [36]. Research conducted by Gul, Chishti, and Bano (2019) in Pakistan revealed that highly educated elderly people have social support and are less socially isolated compared to uneducated elderly

people [42].

The availability of social support and opportunities to be involved in the community can be protective factors against loneliness in the elderly. Maintaining meaningful social relationships, participating in social activities, and accessing support networks are important components for reducing loneliness [33].

Research by Shovestul *et al.* (2020) suggested that someone who lives in an environment where it is difficult to get social support will tend to feel lonely [44].

### Multivariate analysis

The results of the binomial logistic regression multivariate analysis are listed in Table 3.

**TABLE 3** Multivariate analysis of binomial logistic regression

Variable	B	Sig.	Exp(B)	95% C.I. for EXP(B)	
				Lower	Upper
Multimorbidity	0,778	0,036	2,178	1,050	25.678
Social group	20,303	0,999	657106635,502	0,000	3.737
Family support		0,017			
Family support 1 (low-high)	1,849	0,005	6,352	1,741	4.429
Family support 2 (moderate-high)	0,439	0,235	1,551	0,752	
Constant	-0,114	0,658	0,892		24.936

The process of selecting variables that will get into multivariate analysis uses the results of bivariate analysis. The condition for a variable to be included in the multivariate analysis is that the p value in the bivariate analysis is less than 0.25. Variables that qualify for inclusion in the multivariate analysis based on table 3 are age, multimorbidity, mobility impairment and risk of falls, pain, income, education, personality, family function, social group, and social support.

The results of the multivariate analysis showed that only 2 variables were significant for loneliness, namely multimorbidity and social support with an R square of 0.186, which means that the multimorbidity and social support categories could explain 18.6% of

loneliness, the rest were other factors. There are other factors that have not been studied that cause loneliness.

### Conclusion

The results of the study analysis of factors that affect loneliness in the elderly in the Surabaya City with 168 research subjects from 20 areas spread out, namely the biological factors are multimorbidity and pain and psychosocial factors are education, social groups and social support. Multimorbidity and social support slightly influence loneliness, the rest are other factors.

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## Authors' Contributions

All authors contributed to data analysis, article preparation, and manuscript revision and have collectively assumed responsibility for all aspects of this work.

## Conflict of Interest

The authors declared no conflict of interest in this study.

## Ethical Consideration

Ethical Committee approval for this study was obtained from the Faculty of Medicine at Universitas Airlangga; the approval certificate number is 249/EC/KEPK/FKUA/2022.

## Data Availability

The article contains all the necessary data to support the results; no supplementary source data is needed.

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