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The Relationship Between Frailty Syndrome and Depression Among The Elderly in West Java

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A B S T R A C T

Introduction: Frailty is a geriatric syndrome characterized by reduced physiological reserve and increased vulnerability to stressors. Depression is also common in later life and may coexist with physical vulnerability, particularly when older adults experience restricted activity and social contact during the COVID-19 pandemic. **Objective:** This study aimed to examine the association between frailty and depression among community-dwelling older adults who visited a primary health centre in West Java, Indonesia **Methods:** A cross-sectional correlational study was conducted in 2022 during the COVID-19 pandemic. Sixty older adults aged 60 years and above were recruited using convenience sampling from an accessible population of 208 older adults. Data were collected using a demographic and health-characteristics questionnaire, the Indonesian version of the FRAIL Scale, and the 15-item Geriatric Depression Scale. Descriptive statistics and Spearman's rho correlation were used for data analysis. **Results:** Most participants were aged 60-74 years (88.3%). Pre-frailty was the most frequent frailty category (53.3%), followed by non-frail (25.0%) and frail (21.7%). Most participants had no depressive symptoms (70.0%), whereas 16.7% had mild depressive symptoms, 11.7% had moderate symptoms, and 1.7% had severe symptoms. Frailty score was moderately and positively correlated with depression score (Spearman's rho = 0.59; 95% CI: 0.39-0.73; $p < .001$). **Conclusion:** Frailty and depression were significantly associated among older adults in this primary healthcare sample. Because the cross-sectional design does not establish directionality, routine screening for both conditions and longitudinal research are recommended to clarify causal pathways and guide preventive gerontic nursing interventions.

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1. INTRODUCTION

Population ageing is a major public health issue. Globally, the number of people aged 60 years and older is projected to increase from 1.0 billion in 2020 to 1.4 billion by 2030, and Indonesia is also experiencing rapid growth in its older population (Badan Pusat Statistik, 2024; World Health Organization, 2025). This demographic shift requires primary healthcare systems to strengthen early detection of geriatric problems that can reduce independence, quality of life, and healthy ageing.

Frailty is a multidimensional geriatric syndrome marked by reduced physiological reserve and diminished ability to respond to internal and external stressors (Xue, 2011). In Indonesia, community-based data indicate that frailty and pre-frailty are common among older adults, and these conditions are associated with age, comorbidity, functional limitation, and cognitive or psychological problems (Pengpid & Peltzer, 2020; Setiati et al., 2021). The Indonesian version of the FRAIL Scale has been adapted and validated for older adults in Indonesia, supporting its use as a practical screening tool in local clinical and community settings (Dwipa et al., 2021).

Depression is another major geriatric concern because it may reduce motivation, social participation, self-care, nutritional intake, and physical activity. Indonesian evidence shows that depressive symptoms increase with older age and are related to functional status, chronic disease burden, and social conditions (Hariyanto et al., 2020; Ministry of Health of the Republic of Indonesia, 2018). Nursing studies published in Jurnal Pendidikan Keperawatan Indonesia also emphasize that functional independence, cognitive status, marital status, and dementia are closely related to older adults' ability to maintain basic and instrumental activities of daily living (Fitriana et al., 2019; Rohaedi et al., 2016). These factors are conceptually relevant to both frailty and depression.

Previous studies in community, hospital, and long-term care settings have reported a positive association between frailty and depression, although the instruments and populations have varied (Fluetti et al., 2018; Hariyanti et al., 2020; Lohman et al., 2016; Nishikawa et al., 2020; Ozer et al., 2021; Soysal et al., 2017). However, more local evidence is needed from Indonesian primary healthcare settings, especially using an Indonesian frailty instrument and data collected during the COVID-19 period. Pandemic-related restrictions may have reduced social participation, physical activity, and dietary variety among older adults, all of which may increase vulnerability to frailty and depressive symptoms (Ettman et al., 2020; Komazawa et al., 2021; Mete et al., 2022; Otaki et al., 2021; Pilotto et al., 2022).

The unique contribution of this study is the examination of the association between frailty and depression among community-dwelling older adults attending primary healthcare in West Java during the COVID-19 pandemic, using the Indonesian version of the FRAIL Scale and the GDS-15. This study aimed to identify the relationship between frailty and depression among older adults in a primary healthcare setting in West Java, Indonesia.

2. METHODS

Study Design

This study used a cross-sectional correlational design. The design was selected to examine the association between frailty and depression at one point in time among older adults who

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accessed services at one primary health centre in a district of West Java Province, Indonesia. The study was conducted in 2022 during the COVID-19 pandemic, and reporting was strengthened by clarifying study design, setting, participants, variables, measurement, and analysis procedures in line with cross-sectional reporting principles.

Sample

The accessible population comprised 208 older adults who visited the primary health centre during the study period. Participants were recruited using convenience sampling, which was referred to as accidental sampling in the original study protocol. The inclusion criteria were: aged 60 years or older, conscious and in stable general condition, able to understand the study instructions, able to answer all questionnaire items, and willing to provide informed consent. Older adults were excluded if they were unable to complete the interview because of severe communication barriers, severe sensory limitations, acute illness, or limb paralysis that prevented participation in the assessment. COVID-19 infection status was not analysed as a study variable.

The minimum sample size was estimated using power analysis for a correlation test based on Polit and Beck (2004). With alpha = .05, power = .80, and an expected correlation coefficient of .45 based on previous research (Lohman et al., 2016), the minimum required sample was 50 participants. This study recruited 60 participants, exceeding the minimum sample size requirement. The use of convenience sampling may introduce selection bias and limits the generalizability of the findings beyond older adults who accessed the selected health centre.

Instrumen

Frailty was measured using the Indonesian version of the FRAIL Scale. The scale consists of five domains: fatigue, resistance, ambulation, illness, and loss of weight. Each item is scored 0 or 1, producing a total score from 0 to 5. Scores of 0 indicate non-frail, scores of 1-2 indicate pre-frail, and scores of 3-5 indicate frail. The Indonesian version has demonstrated test-retest reliability using kappa statistics and evidence of validity through item-total correlations (Dwipa et al., 2021). In this manuscript, the term FRAIL Scale is used consistently to avoid confusion with the nonstandard term fragile.

Depressive symptoms were measured using the 15-item Geriatric Depression Scale (GDS-15), a brief yes/no self-report instrument designed for older adults (Sheikh & Yesavage, 1986). Total scores range from 0 to 15. In this study, scores of 0-4 were categorized as no depression, 5-8 as mild depressive symptoms, 9-11 as moderate depressive symptoms, and 12-15 as severe depressive symptoms. The Indonesian version of the GDS-15 has shown strong concurrent validity with the Hamilton Rating Scale for Depression and acceptable internal consistency in older adult samples (Utami, 2019). The Cronbach's alpha coefficient for the GDS-15 in the present study was 0.755.

Demographic and health-related characteristics included age, gender, marital status, living arrangement, number of chronic diseases, and self-rated health. These variables were collected because they are known to be associated with frailty and depression among older adults and were used to describe the study sample.

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Data Collection

Data were collected from older adults who visited the primary health centre for healthcare services. Before data collection, the researcher explained the study objectives, procedures, benefits, voluntary nature of participation, and confidentiality safeguards. Participants who agreed to participate signed an informed consent form. Questionnaires were then administered using an interview-assisted approach when needed, so that older adults with limited reading ability could still complete the assessment.

Because data collection occurred during the COVID-19 pandemic, health protocols were applied throughout the process. The researcher used medical masks and gloves, maintained a distance of at least one meter from participants, avoided physical contact such as handshakes, used hand sanitizer, ensured that participants and companions wore masks, and used separate pens or disinfected pens between participants.

Data Analysis

Data were analysed using univariate and bivariate statistics. Univariate analysis was used to describe demographic characteristics, health-related characteristics, frailty category, and depression category using frequencies and percentages. Median and interquartile range were used to describe frailty and depression scores.

Spearman's rho correlation was used to examine the relationship between frailty score and depression score because both variables were ordinal or non-normally distributed. The level of statistical significance was set at $p < .05$. The 95% confidence interval for the correlation coefficient was estimated using Fisher's z transformation. Multivariable analysis was not conducted because the study was exploratory, the sample size was limited, and the available analysis plan focused on the unadjusted association between frailty and depression. Potential confounding by age, gender, chronic disease burden, and self-rated health was therefore addressed in the interpretation and limitations rather than through adjusted modelling.

Ethical Clearance

Ethical approval was obtained from the Research Ethics Commission of Universitas Padjadjaran with approval number 490/UN6.KEP/EC/2022. The study complied with the principles of the Declaration of Helsinki, including respect for persons, voluntary participation, confidentiality, and the right to withdraw without consequences (World Medical Association, 2013). All participants provided informed consent before data collection.

3. RESULT

A total of 60 older adults participated in this study. Most participants were aged 60-74 years (n = 53; 88.3%). Table 1 shows the distribution of frailty categories according to demographic and health-related characteristics. Overall, 15 participants (25.0%) were non-frail, 32 (53.3%) were pre-frail, and 13 (21.7%) were frail. Pre-frailty was most common among participants aged 60-74 years (46.7%), women (30.0%), married participants (33.3%), participants living with a spouse (25.0%), participants with one or two chronic diseases (35.0%), and participants with normal self-rated health (26.7%)

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Anxiety Levels Pre- and Post-Intervention

The results obtained from the anxiety score before the intervention in both groups were 51.7 ± 3.22 indicating that there was no significant difference between the control and intervention groups before treatment $p = 0.999 > 0.05$ and after being given motion graphic based video intervention, the anxiety score dropped to 47.2 ± 3.54 indicating a statistically significant difference between the control group and the intervention group $t = 3.34$, $p = 0.000 < 0.05$.

Table 1. Distribution of Frailty categories by participant characteristics (n = 60)

Characteristic	Non-frail n (%)	Pre-frail n (%)	Frail n (%)
Age (years)			
60-74	13 (21.7)	28 (46.7)	12 (20.0)
75-84	2 (3.3)	3 (5.0)	1 (1.7)
>85	0 (0.0)	1 (1.7)	0 (0.0)
Gender			
Male	10 (16.7)	14 (23.3)	7 (11.7)
Female	5 (8.3)	18 (30.0)	6 (10.0)
Marital status			
Married	12 (20.0)	20 (33.3)	7 (11.7)
Divorced/widowed	3 (5.0)	12 (20.0)	6 (10.0)
Living arrangement			
Living alone	2 (3.3)	3 (5.0)	0 (0.0)
With spouse	7 (11.7)	15 (25.0)	3 (5.0)
With child	2 (3.3)	12 (20.0)	6 (10.0)
With spouse and child	2 (3.3)	2 (3.3)	3 (5.0)
With other family/others	2 (3.3)	0 (0.0)	1 (1.7)
Number of chronic diseases			
None	7 (11.7)	9 (15.0)	1 (1.7)
1-2 diseases	8 (13.3)	21 (35.0)	9 (15.0)
3 or more diseases	0 (0.0)	2 (3.3)	3 (5.0)
Self-rated health			
Good	9 (15.0)	12 (20.0)	0 (0.0)
Fair/normal	5 (8.3)	16 (26.7)	5 (8.3)
Poor	1 (1.7)	4 (6.7)	8 (13.3)

Table 2 presents the distribution of depression categories. Most participants were in the normal category (n = 42; 70.0%). Mild depressive symptoms were found in 10 participants (16.7%), moderate symptoms in seven participants (11.7%), and severe symptoms in one participant (1.7%). Normal depression scores were most frequent among participants aged 60-74 years (65.0%), men (38.3%), married participants (51.7%), participants living with a spouse (31.7%), participants with one or two chronic diseases (43.3%), and participants with fair/normal self-rated health (31.7%).

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Table 2. Distribution of depression categories by participant characteristics (n = 60)

Characteristic	Normal n (%)	Mild n (%)	Moderate n (%)	Severe n (%)
Age (years)				
60-74	39 (65.0)	8 (13.3)	6 (10.0)	0 (0.0)
75-84	2 (3.3)	2 (3.3)	1 (1.7)	1 (1.7)
>85	1 (1.7)	0 (0.0)	0 (0.0)	0 (0.0)
Gender				
Male	23 (38.3)	6 (10.0)	2 (3.3)	0 (0.0)
Female	19 (31.7)	4 (6.7)	5 (8.3)	1 (1.7)
Marital status				
Married	31 (51.7)	7 (11.7)	1 (1.7)	0 (0.0)
Divorced/widowed	11 (18.3)	3 (5.0)	6 (10.0)	1 (1.7)
Living arrangement				

Table 2. Distribution of depression categories by participant characteristics (n = 60)
(Continue)

Characteristic	Normal n (%)	Mild n (%)	Moderate n (%)	Severe n (%)
Living alone	2 (3.3)	1 (1.7)	1 (1.7)	1 (1.7)
With spouse	19 (31.7)	5 (8.3)	1 (1.7)	0 (0.0)
With child	13 (21.7)	2 (3.3)	5 (8.3)	0 (0.0)
With spouse and child	5 (8.3)	2 (3.3)	0 (0.0)	0 (0.0)
With other family/others	3 (5.0)	0 (0.0)	0 (0.0)	0 (0.0)
Number of chronic diseases				
None	13 (21.7)	2 (3.3)	1 (1.7)	1 (1.7)
1-2 diseases	26 (43.3)	8 (13.3)	4 (6.7)	0 (0.0)
3 or more diseases	3 (5.0)	0 (0.0)	2 (3.3)	0 (0.0)
Self-rated health				
Good	18 (30.0)	2 (3.3)	1 (1.7)	0 (0.0)
Fair/normal	19 (31.7)	5 (8.3)	1 (1.7)	1 (1.7)
Poor	5 (8.3)	3 (5.0)	5 (8.3)	0 (0.0)

Table 3. Effect of Demographic Variables on Anxiety Scores at Pre-test and Post-test

Variable	Median	IQR	Spearman's rho (95% CI)	p-value
Frailty score	1.00	1.75	0.59 (0.39-0.73)	< .001
Depression score	3.00	3.00		

4. DISCUSSION

This study found that pre-frailty was the most common frailty category among community-dwelling older adults attending a primary health centre in West Java. This finding is consistent with Indonesian and international evidence showing that pre-frailty is often more prevalent than frailty among community-dwelling older adults (Pengpid & Peltzer, 2020; Setiati et al., 2021;

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Shinohara et al., 2021). The high proportion of pre-frailty is clinically important because pre-frailty is a transitional and potentially modifiable condition. Early screening in primary healthcare can identify older adults who may benefit from physical activity promotion, nutrition support, chronic disease management, and fall-prevention interventions before functional decline progresses.

The pattern of frailty in this study was also related to clinical and functional vulnerability. Frailty was more frequent among participants with poorer self-rated health and multiple chronic diseases. This is consistent with the concept that frailty reflects the accumulation of physiological, functional, and disease-related deficits (Xue, 2011). Chronic disease burden may limit mobility, reduce endurance, and increase fatigue, whereas poor self-rated health may capture subjective experiences of declining physical, psychological, and social well-being (Chu et al., 2021; Ghosh et al., 2021). These findings support the need for integrated gerontic nursing assessment that includes both objective health problems and older adults' own perception of health.

The COVID-19 pandemic provides an important context for interpreting these findings. Restrictions on mobility and social contact were necessary for infection control, but they may have indirectly increased frailty risk through reduced physical activity, altered eating patterns, and limited social participation. Studies during the pandemic reported changes in frailty trajectories, dietary variety, and physical activity among older adults (Mete et al., 2022; Otaki et al., 2021; Pilotto et al., 2022; Shinohara et al., 2021). In the present study, the high proportion of pre-frailty may therefore reflect both underlying age-related vulnerability and pandemic-related changes in daily routines. However, because this study did not include pre-pandemic comparison data, this interpretation must be treated cautiously.

Most participants in this study were categorized as having no depressive symptoms. This finding may be partly explained by the predominance of younger-old participants aged 60-74 years, continued family co-residence among many participants, and possible resilience in later life. Previous literature suggests that many older adults maintained psychological resilience during the pandemic, especially when social support, spirituality, positive emotions, and adaptive coping were present (Lind et al., 2021; Vahia et al., 2020). Nevertheless, nearly one third of participants had mild to severe depressive symptoms, indicating that depression screening remains necessary in primary healthcare services for older adults.

The main finding was a moderate positive association between frailty and depression. This finding is consistent with previous studies showing that older adults with frailty are more likely to experience depressive symptoms and that depression is associated with frailty across settings and instruments (Fluetti et al., 2018; Hariyanti et al., 2020; Lohman et al., 2016; Ozer et al., 2021; Soysal et al., 2017). The correlation coefficient in this study was similar to prior Indonesian evidence from Malang, which reported a significant relationship between cognitive impairment, depression, and frailty (Hariyanti et al., 2020).

Several mechanisms may explain the association between frailty and depression. First, frailty may restrict mobility, reduce independence, and increase fatigue, which can contribute to social withdrawal and depressive symptoms. Second, depression may reduce motivation for physical activity, adherence to treatment, food intake, and social participation, thereby increasing vulnerability to frailty. Third, both conditions may share biological and behavioural pathways, including inflammation, hypothalamic-pituitary-adrenal axis dysregulation, sedentary behaviour,

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poor nutrition, sleep disturbance, and chronic disease burden (Buigues et al., 2015; Perez et al., 2021; Soysal et al., 2017; Yildirim et al., 2021). Because these pathways may operate in both directions, frailty and depression should be understood as interrelated geriatric syndromes rather than as a simple one-way causal relationship.

The findings have implications for community and gerontic nursing practice. Primary healthcare nurses should consider routine screening for both frailty and depression among older adults, especially those with chronic diseases, poor self-rated health, limited mobility, or reduced social support. Screening can be followed by brief interventions such as structured physical activity, nutrition counselling, family engagement, social participation programmes, medication review, and referral for mental health support when depressive symptoms are identified. The use of brief tools such as the FRAIL Scale and GDS-15 is feasible in primary healthcare because they are relatively simple and do not require complex equipment.

This study has several limitations. First, the cross-sectional design prevents causal inference and does not clarify the direction of the relationship between frailty and depression. Second, convenience sampling from one primary health centre limits representativeness and may introduce selection bias because participants were older adults who accessed health services. Third, the sample size was sufficient for correlation analysis but limited for multivariable modelling. Therefore, potential confounders such as age, gender, chronic disease burden, living arrangement, and self-rated health could not be statistically controlled. Fourth, COVID-19 infection status and detailed pandemic exposure variables were not analysed. Future studies should use larger samples, probability sampling when possible, and longitudinal or multivariable designs to clarify whether frailty predicts depression, depression predicts frailty, or both are shaped by shared determinants.

5. CONCLUSION

This study found a significant moderate positive association between frailty and depression among community-dwelling older adults attending a primary health centre in West Java, Indonesia. Pre-frailty was the most frequent frailty category, while most participants had no depressive symptoms. The findings support routine screening for frailty and depression in primary healthcare and highlight the need for integrated gerontic nursing interventions that address physical vulnerability, chronic disease management, activity, nutrition, family support, and mental health. Because this study used a cross-sectional design, longitudinal research is needed to clarify causal pathways and to determine whether early intervention for frailty can reduce depressive symptoms, or whether depression management can prevent progression of frailty.

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8. AUTHOR CONTRIBUTION

All authors contributed to the conception and design of the study, data collection, data analysis, interpretation of findings, manuscript drafting, and critical revision of the manuscript. All authors read and approved the final version of the manuscript for submission.

9. CONFLICT OF INTEREST DISCLOSURE

The authors declare no conflick of interest

10. DATA AVABILITY STATEMENT

The data supporting the findings of this study are available from the corresponding author upon reasonable request, subject to ethical approval and participant confidentiality requirements.

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