

RELATIONSHIP BETWEEN BIOLOGICAL ASPECT OF LIFE WITH DEPRESSIVE DISORDERS IN THE ELDERLY AT THE SCHOOL OF ELDERLY

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ABSTRACT

Introduction: Depressive disorders are one of the most common disorders throughout the world, with a prevalence reaching 5.7% in elders aged over 60 years. In the elderly, depressive disorders can make patients feel miserable, worsen medical conditions, and require a proper support system. **Aims:** This study aims to explore the relationship between physical activity, cognitive ability, and medical history with depressive disorders in the elderly population in Pondok Labu, South Jakarta, Indonesia. **Methods:** A cross-sectional quantitative approach was utilized, involving elderly participants from the School of Elderly RPTRA Pinang Pola. Data were gathered via questionnaires, and analyses included univariate and bivariate methods, with the chi-square test assessing relationships between variables. **Results:** Among the 34 participants, 88.2% showed non-concerning levels of depression, while 11.8% exhibited light depression. Physical activity levels of intensity were light for 11.8%, moderate for 64.7%, and high for 22.3% of participants. Cognitive assessments indicated that 2.9% were below average, 94.1% were normal, and 2.9% were above average cognitive ability. Regarding medical history, 61.8% had up to two diseases, while 38.2% had more than two diseases. Bivariate analyses revealed no significant relationships between depression levels and physical activity ($p=0.551$), cognitive ability ($p=0.118$), or medical history ($p=0.627$). **Conclusion:** These findings suggest that depression may be influenced by factors beyond those studied here, highlighting the need for broader research on depression determinants in the elderly such as the level of loneliness and the function of family and friends in the elder's environment.

Keywords: Cognitive, Depression, Elderly, Medical History, Physical Activity

INTRODUCTION

Becoming an elderly is something that happens and unavoidable for every person who is given the good fortune to live a long life (Hartutik and Nurrohman, 2022). According to Badan Pusat Statistik (The Central Bureau of Statistics) in Indonesia as of March 2022, 10.48% of the total population in Indonesia are elderly, with elderly dependency ratio of 16.09 (Badan Pusat Statistik, 2022). Based on data for Jakarta from Badan Pusat Statistik in 2020, 8.59% of Jakarta's total population are elderly (Badan Pusat Statistik, 2020).

Interconnected mechanisms propel the aging process, leading to distinctive phenotypes such as altered body composition, energy imbalance, homeostatic disruption, neurodegeneration, and reduced neuroplasticity. Established aging theories suggest that these phenotypes arise from a disparity between stressors and buffering mechanisms, coupled with diminished compensatory reserves, causing the buildup of irreversible damage (Bektas et al., 2018).

There are biological aspects in life that can contribute to changes in the elderly, such as physical conditions, cognitive

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function, and diseases (Remes, Francisco and Templeton, 2021). Other factors that may contribute to the biological factor are mobility impairment, alcohol consumption, and smoking (Maier et al., 2021). Biological factors play a significant role in promoting successful aging among the elderly. Older adults who suffer from chronic illnesses often feel dissatisfied with their living conditions (Mubshirah, 2017).

Dissatisfaction with life can be associated with several adverse health outcomes, including long-lasting negative health impacts (Antonella Gigantesco et al., 2019). In the elderly, depressive disorders can make patients and families feel miserable, worsen medical conditions, result in movement disorders, and require a proper support system (Herawati and Deharnita, 2019b). Depressive disorders are one of the most common disorders throughout the world, with a prevalence reaching 5.7% in elders aged over 60 years (Handajani et al., 2022).

Elderly people who have two or more illnesses are more susceptible to depression. In addition, those who are less able to adapt to their physical conditions because of the illness they suffer from may feel anxious and depressed (Rachmawati et al., 2023). The most critical changes in cognition with normal aging are decreased performance on cognitive tasks that require a person to process or change information quickly to make decisions, including measures of processing speed, working memory, and executive cognitive function (Murman, 2015).

A less active lifestyle can cause physical changes, such as reduced maximum aerobic capacity, muscle strength, motor response, and overall body function capacity (Oliveira et al., 2019). Regular physical activity can increase growth and development and benefit the physical, mental, and psychosocial health needed in the activity process (Remes, Francisco and Templeton, 2021).

Description of the School of Elderly

This research was conducted at the School of Elderly, which is a non-formal school specifically for the elderly located at Pinang 2 street, Pondok Labu, South Jakarta, DKI Jakarta Province. The School of the Elderly is one of the government's policies to increase the development of the elderly under the National Population and Family Planning Agency. This school has activities aimed at increasing the elderlies' understanding of the concept of smart within the scope of the seven dimensions of resilient elderly (spiritual, physical, emotional, intellectual, social, professional vocational, and environmental) and increasing the elderlies' knowledge about the process of healthy and sick aging. The School of Elderly holds two meetings in a month. The first one is on the first Wednesday of the month, and the second one is on the last Wednesday of the month. The School of Elderly has its curriculum, starting from Standard 1 (S1), Standard 2 (S2), and Standard 3 (S3). All elders who have attended 12 meetings in this School will graduate as S1. After that, the elders will continue until S3. The elders can still attend the meetings at the School of the Elderly despite their graduation from S3.

None of the research that were carried out before has entirely focused on the biological aspects of the biopsychosocial-spiritual model in researching the causes of depression in the elderly in Indonesia. This research is expected to determine the relationship between physical activity, cognitive ability, and medical history with depressive disorders in the elderly.

METHODS

This quantitative study utilizes a cross-sectional design to explore the relationships among physical activity, cognitive ability, and medical history in

elderly individuals at the School of Elderly RPTRA Pinang Pola in Pondok Labu, South Jakarta, Indonesia. The sample size was determined to be a minimum of 34 participants, calculated using a proportion difference hypothesis based on previous research findings. Subjects are the elders from the School of Elderly. Subjects are chosen based on inclusion criteria, which include elderly individuals aged 60 years or above, those who agree to complete the questionnaire form, and those who can communicate effectively. The exclusion criteria include elders with a history of diseases that can cause bias in the questionnaire, such as visual and hearing impairments.

Primary data were collected directly through questionnaires distributed to respondents in October 2024. The study identifies depression as the dependent variable, while physical activity, cognitive ability, and medical history serve as independent variables. Depression levels were assessed using the Geriatric Depression Scale (GDS-15), physical activity was measured using the International Physical Activity Questionnaire (IPAQ), cognitive ability was evaluated through the Digit Span Test, and medical history was obtained via a questionnaire designed to tally the number of diseases reported by the participants. All measurement instruments underwent rigorous validity and reliability checks prior to implementation.

The GDS-15 has a parameter that measures the level of depression. There are 15 questions, and each question will have 0 (zero) or 1 (one) point. The total score will determine the results. Scores 0-4 are normal, 5-8 are mild depression, 9-11 are moderate depression and 12-15 are severe depression. The IPAQ has a parameter that measures the level of activity. The unit of measurement in this questionnaire is Metabolic Equivalent (MET). The score <600 MET – minute/week is considered as light-intensity activities, 600-3000 MET – minute/week is considered as moderate-

intensity activities, and >3000 MET minute/week is considered as vigorous-intensity activities. The digit span test has a parameter that determines the level of cognitive specifics in short-term memory. There are two types of questions, i.e., the forward test and the backward test. The scores from both tests have a scale of up to 30. For scores of 1-9, the level of short-term memory is below average. For a score of 10-20, the level of short-term memory is average. For scores of 21-30, the level of short-term memory is above average. Following data collection, all responses were systematically coded, processed, cleaned, and analyzed. Univariate analysis was conducted to outline the characteristics of the elderly participants at the School of Elderly. For bivariate analysis, the chi-square test was used to examine the relationships between physical activity and depression, cognitive ability and depression, and medical history and depression.

In the demographic data, there are age, religion, sex, last education, marital status, and last occupation data that are being collected and analyzed in this research. According to the World Health Organization (WHO), elders can be classified into four categories, i.e., the Young Old (60-69 years old), the Old (70-79 years old), the Old Old (80-89 years old), and the Very Old (>90 years old). Religions can help someone become better in a life full of pressure, making a new meaning of life full of hope (Bonelli et al., 2012). Spirituality can be the way to cope with loneliness in elders (Bini' Matillah, Susumaningrum and A'la, 2018).

The current review revealed significant empirical support for the gender disparity in depression among individuals aged 60 and older. Findings indicated that older women reported more severe depressive symptoms and more frequently diagnosed with unipolar depression compared to their male counterparts (Girgus, Yang and Ferri, 2017). In Jakarta,

it is founded that there was no relations between sex and depression in Panti Werdha (Mumulati, Niman and Indriarini, 2020).

Older age and low educational levels were risk factors for depression. Better educated older adults were less likely to experience depression than less educated older adults (Cheah et al., 2024). In Jakarta, it is found that there was a relationship between last education and depression in nursing homes. The higher the level of education can make the elders having open minded to receive new things and develop new skills (Mumulati, Niman and Indriarini, 2020).

The results indicated that marital status was significantly predictive of cognitive impairment among older people, and those with a spouse exhibited higher cognitive functioning. Informal social support and depression were found to play partial mediating roles in the association between marital status and cognitive impairment (Zhang, Zheng and Li, 2024). In Jakarta, it is found that there was no relations between marital status and depression in nursing home (Mumulati, Niman and Indriarini, 2020). Elders who got employed have lower late-life depressive symptoms than the seniors in the non-employed group (Park et al., 2016).

The Process of Conducting Research

The research was conducted using a cross-sectional observational design. Data collection for this study was carried out in October 2024. Researchers used a questionnaire to collect primary data regarding physical activity, cognitive abilities, medical history, and depressive disorders in the elderly. The total number of School of Elderly participants was 80 people; however, on the day of data collection, there were only 42 elderly people present to take part in data collection activities, and there were only 34 elderly people who met the research inclusion criteria. The characteristics studied were

age, religion, gender, highest level of education, marital status, and previous employment.

Research analysis was carried out univariately to determine the characteristics of the sample, then continued with bivariate analysis to determine the relationship between physical activity and depressive disorders, determine the relationship between cognitive ability and depressive disorders, and determine the relationship between medical history and depressive disorders. Analysis was carried out using computerized data analysis via computer devices. This research has been approved by the Ethics Committee of Universitas Pembangunan Nasional “Veteran” Jakarta with ethical clearance number: 353/VIII/2024/KEP.

RESULT

Demographic Data of the Respondent in The School of Elderly

Table 1 shows that 15 (44.1%) of respondents were Young Old (60-69 years), 17 (50%) were Old (70-79 years), and 2 (5.9%) were Old Old (80-89 years). The average age of the School of Elderly respondents is 71 years old. Then by religion, 32 respondents are Muslim (94.1%), 1 Catholic (2.9%), and 1 Christian Protestant (2.9%). There were 31 female (91.2%) and 3 male (8.8%) respondents.

In the aspect of last education, the number of respondents whose last education was elementary school was 3 people (8.8%), junior high school was 1 person (2.9%), senior high school was 15 people (44.1%), 2-year diploma was 2 people (5.9%), another two people (5.9%) had a 3-year diploma degree, 7 people had a bachelor degree (20.6%), and 4 people had a master's degree (11.8%).

In the aspect of marital status, respondents with widow/widower status were 18 (52.9%), and those with a living partner were 16 (47.1%). Finally, in the aspect of previous jobs, 10 respondents have previous job as civil servants (29.4%),

6 respondents were teachers (17.6%), five were housewives (14.7%), four were private employees (11.8%), one was a church servant (2.9%), one was a tailor

(2.9%), one was a nurse (2.9%), one was a make-up artist (2.9%), one was self-employed (2.9%), and 4 people (11.8%) were unemployed.

Table 1. Relations Between Independent and Dependent Variables with Demographic Data

Independent Variable	Category	Depression Levels				Total		P-value
		Normal		Mild Depression				
		n	%	n	%	n	%	
Physical Activity Intensity	Light	3	75	1	25	4	100	0.551
	Moderate	19	86.4	3	13.6	22	100	
	Vigorous	8	100	0	100	8	100	
Cognitive Ability	Below Average	0	0	1	100	1	100	0.118
	Normal	29	90.6	3	9.4	32	100	
	Above Average	1	100	0	0	1	100	
Medical History	0-2 Diseases	19	90.5	2	9.5	21	100	0.627
	>2 Diseases	11	84.6	2	15.4	13	100	
Age	Young Old	13	86.7	2	13.3	15	100	1.000
	Old	15	88.2	2	11.8	17	100	
	Old Old	2	100	0	0	2	100	
Religions	Islam	28	87.5	4	12.5	32	100	1.000
	Catholic	1	100	0	0	1	100	
	Christian	1	0	0	0	1	100	
Sex	Male	27	87.1	4	12.9	31	100	1.000
	Female	3	100	0	0	3	100	
Education Levels	Elementary – High School	16	84.2	3	15.8	19	100	0.613
	Diploma, Bachelor, or Above	14	93.3	1	6.7	15	100	
Marital Status	Married	17	94.4	1	5.6	18	100	0.323
	Widow	13	81.3	3	18.7	16	100	
Last Occupancy Status	Working	23	92.0	2	8.0	25	100	0.281
	Unemployed	7	77.8	2	22.2	9	100	

Characteristics of Respondent Based on Physical Activity

This research indicated a notable trend in physical activity levels among elderly respondents, revealing that those engaged in moderate-intensity physical activity significantly outnumbered individuals participating in light- or

vigorous-intensity activity levels. Specifically, only four individuals (11.8%) reported being engaged in light-intensity physical activities, while a substantial majority, i.e., 22 individuals (64.7%), were involved in moderate-intensity activities. Additionally, 8 individuals (23.5%) were classified as actively engaged in vigorous-intensity physical activity.

Characteristics of Respondent Based on Cognitive Ability

Based on Table 1, this research indicated that respondents with a normal level of cognitive ability, as assessed by the digit span test, demonstrated the highest levels of cognitive performance determined by memorizing compared to those with below-average or above-average abilities. Specifically, 32 respondents (94.1%) were categorized as having normal cognitive ability, while 1 respondent (2.9%) was identified as below average and another respondent (2.9%) as above average.

Characteristics of Respondent Based on Medical History

Based on data presented in Table 1, this research indicated that more respondents had a medical history in the few categories (0-2 diseases) than respondents with a medical history in the many categories (>2 diseases). In total, respondents with a few medical histories were 21 people (61.8%). On the other hand, respondents with many medical histories were 13 people (38.2%). The elderly population surveyed appears healthier with fewer medical issues, likely due to their lifestyle choices and preventive health measures.

Number of Elderly in Depression

Based on data presented in Table 1, this research indicated that there were 30 respondents whose level of depression was Normal (88.2%). On the other hand, there were four respondents whose level of depression was light (11.8%). None of the elderly fall into the category of moderate or high level of depression.

Relationship Between Physical Activity and Depression

Based on Table 1, the analysis examining the relationship between physical activity and depression levels revealed that among participants engaging

in light physical activity, one person (25%) experienced mild depression. In contrast, in the moderate levels of physical activity, three individuals (75%) reported mild depression. Statistical tests further indicated that there was no significant relationship between the level of physical activity and depression, as shown by a p-value of 0.551 ($p > 0.05$). These findings suggest that variations in physical activity levels may not significantly impact depression.

Relationship Between Cognitive Ability and Depression

The comprehensive analysis of the relationship between cognitive capacity and depression levels indicated that only one individual, representing twenty-five percent of the total, exhibited mild depression among those with below-average cognitive abilities. Conversely, three individuals constituted seventy-five percent of the cohort exhibiting normal cognitive function and mild depression. The p-value for the correlation between cognitive capacity and depression levels was 0.118 ($p > 0.05$), indicating that statistical testing found no significant relationship between the two. The findings of this study suggest that cognitive capacity may not be the sole determinant significantly affecting depression.

Relationship Between Medical History and Depression

The study examining the relationship between medical history and the severity of depression found that two individuals, or fifty percent, exhibited mild depression with a history of zero to two illnesses. Conversely, two individuals, representing fifty percent, exhibited mild depression when afflicted with more than two diseases. Statistical analyses revealed no significant correlation between cognitive capacity and the level of depression. The p-value for this relationship was 0.627, which is higher than 0.05, which means that the relationship was not important. Because

there is no strong link, it seems that the number of individual medical histories may not be the only thing that affects the outcome. Medical history alone may not be a decisive factor.

DISCUSSION

Relationship Between Physical Activity and Depression

This research provides valuable insights into the physical activity levels of elderly individuals, highlighting noteworthy trends and implications for their overall well-being. Among the 34 elderly respondents surveyed, it was found that those engaging in moderate-intensity physical activities represented a significant majority, i.e., 22 individuals (64.7%). In contrast, just four people (11.8%) said they are engaged in light-intensity physical activity and eight people (23.5%) said they are engaged in vigorous-intensity physical activity. The category of moderate-intensity exercise includes a range of activities usually accessible to elderly people, such as cycling slowly, sweeping, and lifting small objects. These pursuits help the elderly to stay physically active, improve their daily quality of life and functional independence.

When considered through the prism of general quality of life, the results of the study are noteworthy since Oliveira et al., (2019) show that older persons who keep regular physical exercise report a better quality of life than their inactive counterparts. The School of Elderly Program that supports different physical activities catered especially for seniors helps to further enhance this association. These events, all meant to promote physical health and social contact of the participants, consist of planned workout sessions, interesting singing lessons, and energetic dancing sessions. Especially many older people include walking into their everyday activities, indoors or outside, committing at least ten minutes every day. This regular physical exercise shows a great commitment to preserving a physically

active lifestyle, which is absolutely vital for older people. The value of consistent physical activity cannot be emphasized since it is so important for supporting development, growth, and many health advantages including physical, psychological, and psychological components. Especially for the senior population, this is very important since Remes et al., (2021) underlines that an active lifestyle could increase emotional resilience. According to the study, elderly people who participate actively in physical activities showed much less depression than their more inactive peers.

Only four of the 34 people who responded to the survey reported having a mild form of depression. An investigation into the relationship between varying degrees of physical activity and levels of depression revealed some fascinating patterns. In the group of people who participated in light physical exercise, one individual (25%) was reported experiencing mild depression. In the group of people who participated in moderate activity, three individuals (75%) were reported experiencing similar feelings of mild depression. Statistical test revealed that there was no significant link between levels of depression and physical activity, despite the fact that the p-value for this correlation was 0.551. These findings are consistent with those obtained by Sari (2021) and Miftaachul Muharrom (2020), who conducted research in the past and found p-values of 0.373 and 0.559, respectively. This indicates that there is no statistically significant correlation in this particular field.

It is important to understand that the senior population is rather diverse and consists of a wide spectrum of social, psychological, and physical situations. Among older people, several elements—including physical health, the availability of social support, and personal mental well-being—have great influence on how physical activity affects emotional health. Answers to physical activity and how it

affects psychological well-being might vary greatly from one person to another. Elderly people who participate in daily activities, for example, may feel less bored and more satisfied with their lives, which would be quite helpful for mental health development.

Still, it is also important to realize that depression levels among older people can be very much influenced by various factors, such as family support dynamics, socioeconomic level, and personal mental health history. These elements might significantly affect their psychological well-being than physical exercise alone. These results underline for practitioners and legislators the need to use a comprehensive strategy to meet the mental health requirements of the aged population. We can help to improve the general quality of life for senior citizens by encouraging physical exercise and social support systems as well as by tackling more general socioeconomic issues. Development of efficient treatments aimed at both physical and mental health in this aging population depends on this multifarious knowledge.

Relationship Between Cognitive Ability and Depression

This research revealed that respondents with a normal level of cognitive ability based on the digit span test were the most common compared to below and above average. There were 32 respondents (94.1%) with normal levels of cognitive ability, one respondent (2.9%) was below the average, and one respondent (2.9%) was above the average. Cognitive changes are disturbances in cognitive function, resulting in imbalance in daily life, both in activities and social aspects. Weaknesses in cognitive function begin with reduced memory or forgetfulness. This is often found in elderly people over 65 years old but can also attack individuals of 40 years old. These cognitive changes can result in changes in life because the effects also occur in the family, community, or environment. Many elderly people

experience depressive disorders when cognitive changes occur (Basri, 2018). However, of the 34 respondents in this study, it was found that there were 32 elderly people whose level of cognitive ability was in average condition, and there was only one elderly person whose level of cognitive ability had decreased. This shows that elderly people in the School of Elderly tend to maintain their cognitive abilities with the activities they carry out daily. The school of elderly also provide programs that can hone cognitive abilities, such as brain exercises for the elderly. Then, at each meeting, the elderlies are asked to form groups to prepare activities for the next meeting. For example, the elderlies will make poetry musicals at the next meeting so that they will prepare poems or songs to be sung. Apart from that, in certain months, the elderlies who are at the School of Elderly will carry out visiting activities outside the school of elderly—for example, attending a public lecture on the elderly conducted by the Faculty of Psychology, University of Indonesia, or going for a holiday to a destination such as Bandung. Activities like this can keep the cognitive abilities of the elderly in normal condition.

Of the 34 respondents, four elderly people experienced mild depression, where the results of the analysis of the relationship between cognitive ability and the level of depression showed that one person (25%) experienced mild depression at a below-average level of cognitive ability, while at a normal level of cognitive ability. There were three people (75%) experiencing mild depression. From the statistical test results, it was concluded that there was no significant relationship between cognitive ability and the level of depression, where the $p\text{-value}=0.118$. This result aligns with the research conducted by Maulana et al. (2023), where the $p\text{-value}=0.979$. However, this result is inversely proportional to research conducted by Aprilla et al. (2023), where the $p\text{-value}=0.015$. Many factors, including social, emotional, and physical conditions, often influence depressive

disorders in the elderly. Memory ability or memory in older people is the cognitive aspect that often shows the first and most common decline (Afrilda et al., 2021). Cognitive ability may not be the primary determinant of the mental health of the elderly. In an elderly person who experiences mild depression and has a cognitive ability score below average, this can be seen from other factors such as demographic conditions. This elderly person lives with his family, but his marital status is widow/widower. This indicates that the elderly person has lost their partner. This could also impact on equality factors that were not examined in this study.

Although memory and other cognitive functions are important, social and emotional factors also play significant roles. Family and friends' support can reduce the negative impact of cognitive decline, creating a more positive and supportive environment. This research provides valuable insights into the cognitive abilities and mental health of elderly individuals, mainly focusing on the relationships between cognitive function, depression, and social conditions. The study involved 34 respondents, primarily elderly individuals, who were assessed using the digit span test, a widely recognized measure of cognitive ability. The findings indicate that a significant majority, 32 participants (94.1%), exhibited a normal level of cognitive functioning, while only one individual (2.9%) fell below average, and another one (2.9%) exceeded average cognitive capabilities.

Many times, cognitive changes in the elderly show up as disruptions in cognitive ability that affect social relationships and daily routines. Commonly noticed in people over 65 years old, initial signs of cognitive decline usually include memory loss or forgetfulness; however, these may also be shown in those as young as 40 years old. Such cognitive disabilities could cause personal difficulties as well as more general effects for homes and communities. Especially, as Basri's

2018 study emphasizes, the prevalence of depressive illnesses among senior people undergoing these cognitive alterations is rather significant.

In spite of these concerns, the current analysis found that only one of the 34 respondents exhibited a decline in their average cognitive ability. The majority of the respondents, 32 out of the 34, maintained their average cognitive capacity. This suggests that participation in structured events, such as those provided by the School for the Elderly, is an essential component in the process of preserving cognitive health. Cognitive enhancement activities are provided by this establishment for senior citizens, with the goal of enhancing their cognitive abilities. By holding regular meetings, attendees are given the opportunity to participate in group projects, such as the creation of performances that combine poetry and music, which results in an increase in cognitive stimulation. As an additional benefit, senior citizens frequently take part in organized expeditions, such as public lectures on gerontology or vacations to places like Bandung, which serve to strengthen their cognitive engagement and social interaction. This study also examined the intersection of cognitive ability and depression among the respondents. Out of 34 individuals, four reported experiencing mild depression. Analysis indicated that one person (25%) with below-average cognitive ability experienced mild depression, while three individuals (75%) with normal cognitive ability also reported mild depressive symptoms. Statistical testing confirmed no significant relationship between cognitive ability and depression levels, yielding a p-value of 0.118. This finding corroborates Maulana's 2023 study, which reported a p-value of 0.979. However, it contrasts with Aprilla's 2023 research, where a significant p-value of 0.015 was recorded. This discrepancy suggests that various factors, including social, emotional, and physical conditions,

significantly influence depressive disorders among the elderly.

For instance, one participant exhibiting mild depression and below-average cognitive ability was known to be living with family but identified as a widow or widower. This demographic detail underscores the potential impact of loss and social isolation, which were not directly examined in this study but merit further exploration in the context of mental health. Furthermore, it is important to understand that although memory is a vital ability, mental well-being is much influenced by social and emotional aspects. Strong family and friend support systems help to reduce the negative consequences of cognitive decline and provide more encouraging surroundings. Strong social support networks for the elders are usually more suitable to manage depression since they sense connectivity and worth under trial times. Apart from social aspects, additional elements including family support, financial situation, and mental health background significantly influence the degree of depression among elderly people. These components could significantly affect psychological well-being more than cognitive capacity alone.

Relationship Between Medical History and Depression

The findings of this extensive study revealed a clear trend on the medical histories of the older participants. The data specifically showed that only 38.2% of participants presented a more comprehensive medical history including many diseases (more than two conditions), whereas 61.8% of participants reported a medical history marked by a restricted number of diseases (up to two disorders). This difference implies that a good majority of the older population assessed keeps a rather better profile with less medical difficulties, which could reflect lifestyle choices and preventive health measures in their life.

Common among elderly people, chronic diseases include stroke, sensory disabilities (including diminished auditory and visual capacities), heart disease, and respiratory diseases including chronic obstructive pulmonary disease (COPD) can have significant effects. These long-term diseases can affect not only bodily condition but also have major psychological effects, most notably the start of depression symptoms.

The prevalence of senior people with minimal disease history could suggest that individuals involved in proactive health education campaigns, including the "school of elderly" programs, are probably going to have better health results. These initiatives underline the need of leading healthy lives, which include consistent physical exercise, balanced diet, and mental health practices. Engagement in planned events and social gatherings enabled by these initiatives helps to further improve senior people's general health and happiness.

With a p-value of 0.627, statistical analysis of the parameters used in this study revealed no sizeable relationship between cognitive ability and degrees of depression. This result is in line with earlier studies by Poppy and Widagdo (2018) with a similar p-value of 0.170. Fascinatingly, this absence of relationship implies that many elderly people might have evolved really strong adaptation skills related to their health situation. For others, the acceptance of medical disorders as inevitable aspects of aging may help to reduce anxiety or depression related to their health. On the other hand, as observed in the research by Rachmawati et al. in 2023, elderly people who struggle to manage their chronic diseases may have increased anxiety and depression states.

Moreover, the mental health scene of the elderly is molded by a multitude of elements other than medical background. Psychological well-being of every person depends much on their point of view regarding their illness, their coping skills,

and their management techniques. Strong social support networks from family and friends combined with a positive attitude about one's health can create a safety net shielding seniors from possible mental health crises even in the middle of physical health issues.

One must consider other factors that can combine with medical history to affect depression levels in elderly people. These include personal mental health history, socioeconomic level, and familial support quality and consistency. For example, a person's economic stability can significantly impact access to healthcare resources, prescriptions, and chances for social interaction, all of which are absolutely essential for maintaining mental wellness. When these elements cooperate, they can produce a supportive atmosphere that promotes resilience, emotional, mental, and physical well-being among the elderly, and therefore, demonstrating that a history of disease does not always correspond with higher degrees of depression.

Mechanism of The Results

The absence of significant relationships between depressive disorders and the biological factors examined (physical activity, cognitive ability, and medical history) in the elderly Indonesian samples may be attributable to several underlying mechanisms. First, the participants' engagement in the School of Elderly program—characterized by regular social interactions (twice monthly) and a curriculum emphasizing resilient aging across spiritual, physical, emotional, intellectual, social, professional/vocational, and environmental dimensions—could serve as a protective buffer. This structured environment may mitigate the impact of biological stressors, such as reduced physical activity or multimorbidity, on depression by enhancing compensatory reserves and neuroplasticity, as posited by theories of aging (Bektas et al., 2018). For

instance, even among those with light physical activity (11.8%) or multiple diseases (38.2%), the program's focus on holistic well-being might foster emotional resilience, reducing the likelihood of depression manifesting from biological vulnerabilities alone.

A threshold effect or interaction with unmeasured psychosocial factors could explain the null findings. Depression in the elderly often arises from a disparity between stressors and buffering mechanisms, and in this cohort, where 88.2% exhibited non-concerning depression levels, biological factors like cognitive decline (where only 2.9% of the respondents was below average) or medical history may not have reached a critical threshold to trigger depressive symptoms without concurrent psychosocial triggers, such as loneliness or social isolation (as suggested in the conclusion). Mechanistically, this could involve neuroendocrine pathways, i.e., chronic stress from biological aging typically activates the hypothalamic-pituitary-adrenal (HPA) axis, leading to elevated cortisol and inflammation, which are linked to depression (Remes, Francisco and Templeton, 2021). However, the low prevalence of light depression (11.8%) implies that protective factors—possibly the community's supportive network—may have dampened HPA dysregulation, overriding direct biological influences.

Selection bias inherent to the study population might be the underlying of these results. Participants were active attendees of the School of the Elderly. This non-formal institution promotes healthy aging, which likely self-selects for healthier, more resilient elders. This could result in a "healthy participant effect," where biological risk factors are less pronounced, masking associations observed in broader populations, for example the global prevalence of 5.7% in elders over 60 years old (Handajani et al., 2022). Future studies should incorporate longitudinal designs to track how these mechanisms evolve,

potentially revealing latent effects as participants age further.

Policy Implications

The null associations observed in this study have important policy implications for addressing depressive disorders among Indonesia's growing elderly population, projected to increase with rising life expectancy. First, policies should prioritize expanding community-based programs, such as the School of the Elderly, which appear to act as protective environments against depression by integrating the biological, psychosocial, and spiritual dimensions of aging. The government's existing framework, under the National Population and Family Planning Agency, could be scaled nationally. This framework could incorporate mandatory mental health screenings during bimonthly meetings to identify early signs of depression, even in biologically resilient groups.

Given the suggestion that factors such as loneliness and social support may overshadow biological influences, policies should incorporate family and community involvement. For instance, incentives for family participation in elderly programs could reduce isolation, aligning with WHO recommendations for age-friendly environments. This might include subsidies for transportation to community centers or digital platforms for virtual engagement, particularly in urban areas such as Jakarta, where 8.59% of the population is elderly.

Healthcare policies should adopt a biopsychosocial-spiritual model for elderly care, moving beyond biological interventions to include preventive strategies, such as promoting moderate physical activity (64.7% in this sample) through accessible public spaces. Resource allocation could focus on training community health workers to assess multifaceted depression risks, potentially reducing the economic burden of untreated depression, which exacerbates medical conditions and family distress (Herawati

and Deharnita, 2019). Longitudinal evaluations of such policies would ensure evidence-based refinements, ultimately fostering successful aging and reducing the global prevalence of elderly depression, which currently stands at 5.7% (Handajani et al., 2022).

CONCLUSIONS

Elderly depression is a major issue that has to be taken care of so they may live in the last phase of life both physically and psychologically sound. With 88.2% of the non-depressed category and only 11.8% suffering mild depression, research in the school of the elderly reveals that most of the elderly individuals do not experience depression of any relevance. The elderly's physical activity varied; majority (64.7%) had modest levels of activity, and their cognitive skills were mostly normal (94.1%). This study also revealed that there is no sizeable correlation between physical activity, cognitive ability, disease history, and degrees of depression, thereby stressing the need of a comprehensive strategy to promote mental health of elderly people. Physical activity and depression were not directly linked, but still the elderlies should participate in preferred physical activities to promote general well-being. Engagement in social and community events is recommended to sustain social contacts and participate in initiatives aiming at mental health, such as meditation or relaxation activities.

Active involvement in scheduled activities in the school of elderly is expected to help reduce depression levels among the elderlies. Additionally, the school of elderly is recommended to offer holistic programs encompassing physical activities, social engagement, and mental health support. Education on mental health should be provided to enhance awareness of depression and other psychological issues associated with aging. Workshops, seminars on maintaining mental and physical health, and counseling services are

recommended. The general public is encouraged to foster an inclusive and elderly-friendly environment, spreading accurate information about elderly's health and supporting initiatives that enhance their well-being.

Young generations can contribute by participating in volunteer programs that support the elderly, raising awareness about their mental health needs, and respecting their role in the community. Non-Governmental Organizations (NGOs) are urged to develop specific intervention programs to improve mental health of the elderlies, conduct awareness campaigns to reduce mental health stigma, and collaborate with government bodies to support age-friendly policies. Universitas Pembangunan Nasional "Veteran" Jakarta can utilize this research to design educational programs that enhance elderly mental health and build relationships with the school of elderly for future public health education and research initiatives. It is recommended for the government to develop policies that support senior welfare, to allocate funds for health programs, and to encourage cooperation between health and social sectors to provide integrated services for the elderly. These recommendations aim to improve elders' quality of life despite the absence of direct links between the studied factors. Future research should consider increasing the sample size to expand the study findings.

Strengths

This study demonstrates several key strengths that enhance its contribution to the understanding of depression in the elderly population in Indonesia. Notably, it addresses an under-researched area by focusing on biological aspects, such as physical activity, cognitive ability, and medical history, within the biopsychosocial-spiritual model, where it is noted that prior research in Indonesia has not fully explored these factors. This novelty is supported by relevant contextual data, including Indonesian elderly

demographics from the Central Bureau of Statistics, making the findings particularly pertinent to local public health challenges. The methodology is clear and appropriate, employing a cross-sectional quantitative design with univariate and bivariate analyses (including chi-square tests) to examine associations. Furthermore, the study's practical implications are a strength, as it provides descriptive insights into a relatively healthy elderly group and thoughtfully recommends broader research on factors such as loneliness and family support in its conclusion. Overall, these elements offer valuable baseline data for interventions in resilient aging programs, such as those promoted by the National Population and Family Planning Agency.

Limitations

Despite its contributions, the study has several limitations that should be considered when interpreting the results and planning for future research. The small sample size of 34 participants, drawn exclusively from one urban site in South Jakarta, restricts statistical power and generalizability, potentially explaining the lack of significant relationships. This is compounded by the cross-sectional design, which captures data at a single point in time and cannot establish causality, such as whether reduced physical activity precedes depression or results from it, especially given the dynamic nature of aging processes like neurodegeneration as described in the introduction. Reliance on self-reported questionnaires introduces risks of recall or social desirability bias. While biological aspects are defined, the study narrows its scope to these variables, overlooking psychosocial-spiritual elements despite referencing a broader model, leading to null findings that suggest other influences may be more critical. Geographic specificity to an active, community-engaged group at the School of Elderly further limits applicability to diverse elderly populations, such as those in rural areas or nursing homes. These limitations highlight the need

for larger, longitudinal studies with multivariate analyses to provide a more comprehensive understanding of depression determinants in Indonesian elders.

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