



Research Article

Correlation of Depression Levels and Emotional Eating Behavior with Energy Intake in Elderly

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ABSTRACT

The increasing number of elderly people in Indonesia presents various challenges, especially in the areas of physical and mental health. One of the common issues that often arises is depression and changes in eating behavior, which have the potential to affect daily energy intake. Older adults with unstable psychological conditions tend to experience disruptions in their eating patterns, including decreased appetite or increased food consumption as a response to negative emotions. This study aimed to analyze the relationship between depression levels and emotional eating behavior with energy intake among elderly individuals at Paguyuban Lansia Srikandi, Kelurahan Kapasari, Surabaya. The study employed an analytic observational design with a cross-sectional approach. A total of 69 elderly respondents were selected using a simple random sampling technique. Data were collected using the Geriatric Depression Scale (GDS), the Dutch Eating Behavior Questionnaire (DEBQ), and a Repeated 24-Hour Food Recall form over three days (two weekdays and one weekend). The data were analyzed using univariate and bivariate methods with the Spearman Rank test. The results showed that some elderly respondents experienced mild to severe depression (49.3%) and exhibited high levels of emotional eating behavior (50.7%). Additionally, 44.9% of the elderly were recorded as having insufficient energy intake. The conclusion of this study is that there is a significant relationship between the level of depression and energy intake, with a p-value of 0.016, and also a significant relationship between emotional eating and energy intake, with a p-value of 0.004. It is recommended that older adults receive ongoing psychological support and nutrition education to prevent nutritional problems caused by emotional instability.

Keywords: elderly, depression level, emotional eating behavior, energy intake

INTRODUCTION

A common nutritional problem in the elderly is malnutrition, a condition that often goes unnoticed because the symptoms are barely noticeable until the elderly have progressed to a state of severe malnutrition (Ministry of Health, 2020). Malnutrition is a common nutritional problem in



the elderly. This is due to insufficient energy and protein intake. Elderly individuals suffering from macro- and micronutrient deficiencies will have a weakened immune system and function. If immune function can be improved, the elderly's quality of life will improve, enabling them to become healthy, independent, and self-sufficient, without becoming a burden on their families or communities, and without putting pressure on health services (Boy, 2019). The aim is to examine the relationship between two variables: the independent variables (depression level and emotional eating) and the dependent variable (energy intake in elderly people).

Malnutrition can be caused by various factors, including physical and physiological changes in the body as part of aging, psychosocial and environmental factors, income and food accessibility, and others. Malnutrition is defined as "a pathological condition resulting from an absolute deficiency or excess of one or more essential nutrients." This can consist of four aspects, namely undernutrition, overnutrition, imbalance and specific deficiencies, elderly people are vulnerable to the risk of malnutrition which includes protein-energy malnutrition and micronutrient deficiencies (Chen et al., 2022).

Determinants of dietary intake in older adults indicate that healthy food and eating patterns can help older adults live healthier, stay active for longer, protect themselves from disease, and accelerate recovery from illness. However, a large proportion of older adults (62.1%) have insufficient dietary intake, influenced by factors such as comorbidities, depression, dental problems, medication use, food taste, and number of teeth. This condition is also associated with emotional eating behavior, where older adults tend to eat in response to emotional changes or stress, which often negatively impacts their nutritional status (Amran, 2019).

Emotional eating refers to a person's tendency to eat in response to emotional changes, such as stress or certain feelings, which can affect nutritional intake, particularly in older adults. These changes in eating patterns caused by emotional responses affect energy intake and overall nutritional status (Lazarevich, 2022). Furthermore, mental health, influenced by social changes in daily life, also significantly influences nutritional intake in older adults. If older adults fail to quickly adapt to these changes and attempt to connect with others of the same age, mental tension or stress can arise. Prolonged stress can increase the risk of physical and mental illness and increase the likelihood of depression in older adults (Sarwoko, 2019).

Elderly people experiencing physical decline often feel confused and experience mental disorders such as excessive sadness, anger, or crying, which indicate an unstable mental state. Weakened physical condition, mood swings, and an unsupportive environment often interfere with their appetite, resulting in inadequate nutritional intake (Budi, 2020). A preliminary study conducted at the Srikandi Elderly Community in Kapasari Village, Surabaya City, revealed that out of 15 elderly people, 47% experienced inadequate dietary intake. Therefore, many older adults still experience dietary issues.

MATERIAL AND METHODS

This study is an observational analytical study using a cross-sectional approach. The study population was all 186 elderly people in the Paguyuban Lansia Srikandi, Kapasari Village, Surabaya City. The sampling technique used in this study was simple random sampling, a form of probability sampling. This method involves randomly selecting samples, with each member of the population having an equal chance of being selected (Sugiyono, 2007). The Lemeshow formula was used to determine the sample size. Based on the calculation results, the desired sample size for this study was 63 respondents. However, to anticipate respondents who did not meet the inclusion and exclusion criteria, an additional 10% dropout rate was added. Therefore, the total sample size for this study was 69 respondents.

For the depression level variable, the research instrument used was the Geriatric Depression Scale (GDS), an instrument designed to screen for depressive symptoms in older adults. The GDS questionnaire was administered through an interview with the respondents to ensure that all questions were clearly understood and answered appropriately. Depression levels are divided into four categories: normal (score 0-4), mild depression (score 5-9), moderate depression (score 10-11), and severe depression (score 12-15) (Syuib et al., 2020).

The total GDS score was calculated and classified according to the established scoring criteria into the corresponding levels of depressive symptoms. For the emotional eating variable, the Dutch Eating Behavior Questionnaire (DEBQ), particularly the emotional eating subscale, was used to assess emotional eating behavior. Emotional eating behavior is divided into two categories: low (score ≤ 2.35) and high (score > 2.35) (Sukianto et al., 2020). The questionnaire was administered directly to the respondents through a structured interview. The emotional eating score was calculated based on the responses to the relevant items and subsequently classified according to the predetermined scoring criteria. Energy intake is divided into three categories: insufficient (score $< 80\%$ of the RDA), adequate (score 80-110% of the RDA), and sufficient (score $> 110\%$ of the RDA) (Hardiansya et al., 2021).

The dependent variable, food intake, was assessed using a Repeated 24-Hour Food Recall form to obtain detailed information regarding all foods and beverages consumed by the respondents during the previous 24 hours. Food intake data were collected through an interview conducted by trained researchers/enumerators. The 24-hour food recall was performed three times, consisting of two weekdays and one weekend day, to account for variations in dietary intake between weekdays and weekends. The reported portion sizes were estimated using appropriate household measures or food models/visual aids, where applicable. The recorded food intake was then converted into nutrient intake data and classified according to the predetermined criteria for assessing dietary intake adequacy.

Prior to data collection, the researchers obtained ethical clearance from the Clinical Research Ethics Commission (KEPK) of Nahdlatul Ulama University Surabaya, with the ethical clearance certificate number 0282/EC/KEPK/UNUSA/2025. They also submitted an Informed Consent form to all study participants.

Data analysis in this study included univariate and bivariate analyses. Univariate analysis was used to describe the characteristics of each research variable, and bivariate analysis was used to analyze the relationships between the independent and dependent variables. The bivariate analysis conducted in this study used the Spearman Rank Correlation Test with SPSS version 25 software, as the data scale was ordinal. The analysis results were considered significant if the p-value was < 0.05 (Sig. < 0.05).

RESULTS AND DISCUSSION

a. Characteristics of Respondents Depression Levels

The characteristics of respondents based on their depression levels are presented in Table 1. The depression level was assessed using the Geriatric Depression Scale (GDS), which was administered through an interview with the respondents. The results showed varying levels of depressive symptoms among the elderly respondents. Of the 69 respondents, 15 elderly respondents (21.7%) were classified as severely depressed. Most of these respondents reported receiving little attention from their families, experiencing feelings of loneliness, and tending to withdraw from social interactions. These findings indicate that a substantial proportion of the elderly respondents experienced severe depressive symptoms and may require greater attention and emotional support.

The presence of severe depressive symptoms among the respondents highlights the importance of social and emotional support in maintaining psychological well-being in older adults. Limited family interaction, loneliness, and reduced participation in social activities may contribute to or accompany depressive symptoms in the elderly. Therefore, identifying the level of depression among older adults is important as an initial step in recognizing those who may require further attention or appropriate psychological and social support.

Table 1. Characteristics of Respondents Depression Levels

Variable	Category	Total	
		N	%
Depression Levels	Normal	23	33.3
	Light	22	31.9
	Medium	9	13.0
	Heavy	15	21.7
Total		69	100

Source: Primary Data, 2025

Based on Table 1, of the 69 respondents, 15 elderly respondents (21.7%) were classified as severely depressed. Most of them reported receiving little family attention, feeling lonely, and tending to withdraw from social circles. This condition reflects the need for more intensive emotional support in efforts to prevent mental health problems in the elderly.

Lack of emotional support from family is a dominant factor causing depression in the elderly. Elderly individuals who lack attention from children or grandchildren, or who feel they have lost their role within the family, tend to experience a significant decline in self-esteem (Utami, 2021). This research is also supported by research conducted by Indriani et al. (2022), which also confirmed that the absence of a core family figure, especially a spouse, is strongly correlated with an increased risk of moderate to severe depression in the elderly. Meanwhile, social support has been shown to act as a protective factor against psychological stress.

This is reinforced by the results of research by Rahayu and Dewi (2020), which stated that elderly individuals who are active in community activities and have positive social interactions tend to have better psychological well-being and a lower risk of depression. Therefore, the presence of a supportive environment, family attention, and involvement in social activities not only provide a sense of emotional security for the elderly but also directly impact the prevention of more severe depressive symptoms.

b. Characteristics of Respondents Emotional Eating Behavior

Emotional eating behavior refers to the tendency to consume food in response to emotional states rather than physiological hunger. In this study, emotional eating behavior among the elderly respondents was assessed using the Dutch Eating Behavior Questionnaire (DEBQ), particularly the emotional eating component. The questionnaire was administered through a structured interview to facilitate respondents' understanding of each question and to ensure that the information obtained reflected their usual eating behavior in response to emotional conditions. The characteristics of respondents based on their emotional eating behavior are presented in Table 2.

Based on Table 2, of the 69 elderly respondents in Paguyuban Srikandi, 35 (50.7%) exhibited high levels of emotional eating behavior. These respondents tended to report eating in response to emotional conditions such as loneliness, stress, or anxiety. This finding suggests that emotional factors may be an important consideration when assessing eating behavior among older adults. Therefore, monitoring eating patterns that are triggered by emotional conditions is important to support appropriate nutritional management and to prevent potential nutritional problems among the elderly.

Table 2. Characteristics of Respondents Emotional Eating Behavior

Variable	Category	Total	
		N	%
Emotional Eating Behavior	Low	34	49.3
	High	35	50.7
Total		69	100

Source: Primary Data, 2025

Based on Table 2, of the 69 elderly respondents in Paguyuban Srikandi, 35 (50.7%) exhibited high levels of emotional eating behavior. They tend to eat as an outlet for emotions such as loneliness, stress, or anxiety. This finding indicates the importance of monitoring the eating patterns of elderly people triggered by emotional conditions to prevent more serious nutritional problems.

Most older adults reported eating more often when feeling sad, anxious, lonely, or stressed due to feelings of abandonment, physical limitations, or lack of social activity. Several respondents also acknowledged feeling more comfortable after consuming certain foods as a form of emotional escape. These foods are generally sweet or savory, providing a temporary calming effect, such as cakes, packaged snacks, or high-carbohydrate foods. This behavior requires caution because if it persists without control, it can increase the risk of nutritional disorders, such as excess weight or an imbalance in the macro and micronutrients needed by older adults.

This research aligns with research conducted by Wahyuningsih and Nurhasanah (2021), which explains that older adults with unhealthily channeled negative emotions tend to seek comfort through food consumption, particularly foods high in sugar and fat. This response, known as emotional eating, is a coping mechanism for psychological distress. This research is also supported by research conducted by Dewi and Lestari (2020), which found that an inability to manage emotions is associated with an increased frequency of unhealthy food consumption, thus contributing to an imbalance in energy intake and the risk of excess weight in older adults. Therefore, attention to the psychological aspects of the elderly as well as education regarding stress management and healthy food selection are important in preventing nutritional disorders caused by uncontrolled emotional eating behavior.

c. Characteristics of Respondents Energy Intake

Energy intake is an important indicator in assessing the nutritional adequacy of older adults. Adequate energy intake is necessary to support daily activities, maintain body functions, and prevent nutritional problems. In this study, the energy intake of elderly respondents was assessed using the Repeated 24-Hour Food Recall method. Food consumption was recorded for three non-consecutive days, consisting of two weekdays and one weekend day, to obtain a more representative description of the respondents' usual food intake. The food recall was conducted through an interviewer-administered interview, in which respondents were asked to recall all foods and beverages consumed during the previous 24 hours. Household measurements, food models, or visual aids were used when necessary to assist respondents in estimating portion sizes. The reported food and beverage intake was then converted into energy intake using the appropriate food composition database and subsequently classified according to the energy intake criteria established in this study. The characteristics of respondents based on their energy intake are presented in Table 3.

Table 3. Characteristics of Respondents Energy Intake

Variable	Category	Total	
		N	%
Energy Intake	Less	31	44.9
	Good	22	31.9
	Over	16	23.2
Total		69	100

Source: Primary Data, 2025

Based on Table 3, of the 69 elderly respondents in the Paguyuban Srikandi, 31 (44.9%) were found to have insufficient energy intake. This indicates that nearly half of the respondents are not meeting their daily energy needs, necessitating special attention to nutritional fulfillment to prevent the risk of chronic energy deficiency in the elderly.

Decreased appetite is a major nutritional problem in the elderly, influenced by physiological changes such as taste disturbances, decreased digestive function, and the presence of comorbidities. Elderly individuals who are not accustomed to eating regularly also tend to have low energy intake due to the loss of a daily meal routine (Saputri, 2022). This research is also supported by research conducted by Handayani and Sari (2021), which revealed that economic constraints and low nutritional understanding contribute to the low variety and quality of food consumed by the elderly, resulting in an imbalance in the macro and micronutrients needed by the body. Sustained low energy intake can lead to decreased muscle mass, physical weakness, and an increased risk of falls and impaired mobility in the elderly.

d. Correlation of Depression Levels with Energy Intake on Elderly

Depression and nutritional intake are important factors that may influence the health and nutritional status of older adults. Depressive symptoms may be accompanied by changes in appetite, eating patterns, and motivation to consume food, which may consequently affect daily energy intake. Therefore, this study examined the relationship between depression levels and energy intake among elderly respondents in Paguyuban Srikandi.

Depression levels were assessed using the Geriatric Depression Scale (GDS), while energy intake was obtained using the Repeated 24-Hour Food Recall conducted on two weekdays and one weekend day. The reported food intake was converted into energy intake and subsequently classified

according to the predetermined criteria used in this study. The correlation analysis was conducted to determine whether differences in depression levels were associated with variations in energy intake among the elderly respondents. The results of the analysis are presented in Table 4.

Table 4. Cross Tabulation of Depression Levels with Energy Intake

Depression Levels	Energy Intake						Total	
	1		2		3			
	Less		Good		Over			
	N	%	N	%	N	%		
Normal	6	8.7	9	13.1	8	11.6	23	33.3
Light	10	14.5	7	10.2	5	7.3	22	32
Medium	6	8.7	3	4.3	0	0	9	13
Heavy	9	13	3	4.3	3	4.3	15	21.7
Total	31	44.9	22	31.9	16	23.2	69	100
Mean ±SD	8.19 ± 3.674		6.27 ± 4.355		5.56 ± 4.366			
<i>p-value</i> 0.016								
<i>r-value</i> -0.289								

Source: Primary Data, 2025

Based on Table 4, it can be seen that the majority of elderly with moderate to severe depression have insufficient energy intake, namely 66.7% of elderly with moderate depression and 60.0% of elderly with severe depression. The results of the Spearman correlation test support this finding, with a correlation coefficient of -0.289 and a *p*-value of 0.016 (*p* < 0.05), indicating a statistically significant negative relationship between depression levels and energy intake categories at the 95% confidence level. This means that the higher the level of depression in elderly, the lower their energy intake. This indicates that psychological conditions play a significant role in influencing the fulfillment of elderly nutritional needs, so nutritional interventions need to be accompanied by attention to mental health.

Elderly people with moderate to severe depression experience a significant decrease in appetite, resulting in an average decrease in energy intake of 25–35% compared to elderly people without depression (*p* < 0.05). This decrease is closely related to disruptions in central nervous system regulation that affect the sensations of hunger and satiety. In depression, dysfunction occurs in brain areas such as the hypothalamus and limbic system, which play a key role in regulating eating behavior. The production and balance of neurotransmitters such as serotonin, dopamine, and norepinephrine are disrupted, thus inhibiting the transmission of hunger signals from the body to the brain. This causes individuals, including the elderly, to become insensitive to hunger signals even though the body needs energy. In addition, increased stress hormones such as cortisol that occur in depression can also suppress appetite and accelerate satiety (Richer et al., 2025). Furthermore, this research is also supported by research conducted by Mustika et al. (2022) in their study stating that elderly people with depression have a 2.7 times greater risk of experiencing malnutrition compared to non-depressed elderly people. Psychological symptoms such as loss of interest in eating, mental fatigue, and feelings of worthlessness are major factors in decreased nutritional intake.

e. Correlation of Emotional Eating Behavior with Energy Intake on Elderly

Table 5. Cross Tabulation of Emotional Behavior with Energy Intake

Emotional Eating	Energy Intake			Total
	1	2	3	

Behavior	Less		Good		Over			
	N	%	N	%	N	%		
Low	21	30.4	10	14.5	3	4.3	34	49.2
High	10	14.5	12	17.4	13	18.8	35	50.8
Total	31	45	22	31.9	16	23.1	69	100
Mean ±SD	2.293 ± 0.516		2.445 ± 0.526		2.761 ± 0.374			
p-value 0.004								
r-value 0.339								

Source: Primary Data, 2025

Based on Table 5, it was found that the majority of elderly with high emotional eating behavior tended to have excessive energy intake, namely 37.1%, greater than elderly with low emotional eating, which was only 8.8%. This finding is supported by the results of the Spearman correlation test, which showed a significant positive relationship between emotional eating behavior and energy intake, with a value of $r = 0.339$ and $p = 0.004$ ($p < 0.05$). This means that increased emotional eating behavior in elderly tends to be accompanied by an excessive increase in energy intake. This indicates that emotional factors play a significant role in influencing the consumption patterns of elderly and need to be considered in planning nutritional and psychosocial interventions.

Elderly with low emotional eating tendencies tend to exhibit more regular and controlled eating behaviors. Respondents generally consume food according to physiological needs and at familiar mealtimes. When faced with feelings of sadness, anxiety, or boredom, respondents prefer to engage in other activities such as resting, praying, or interacting with family rather than venting their emotions through food. Conversely, seniors with high levels of emotional eating demonstrate eating behaviors that are more influenced by emotional states. Many respondents stated that food becomes an escape when facing emotional distress such as loneliness, stress, or loss. The types of foods consumed are typically high in calories, fat, or sugar, such as sweet snacks, fried foods, and other light foods. Some respondents also tend to eat outside of main mealtimes, not because they are hungry, but rather as a form of emotional diversion. In fact, some seniors stated that when they feel disappointed or sad, they unconsciously consume larger portions than usual.

Elderly people with emotional disorders generally have low self-control in regulating the amount and frequency of food intake, making them more susceptible to emotional eating. In this condition, foods high in calories, fat, and sugar, known as hyperpalatable foods, are often consumed repeatedly as an emotional outlet. Consuming these foods can increase appetite, reduce sensitivity to satiety signals, and disrupt brain function that regulates eating behavior. Neurologically, these types of foods stimulate the brain's reward center through the release of neurotransmitters such as dopamine and serotonin. Activation of the mesolimbic and hypothalamic pathways, which play a role in regulating emotions and eating motivation, produces a temporary feeling of pleasure and calm. Dopamine functions to drive motivation to seek pleasure, while serotonin plays a role in regulating mood and providing a sense of well-being. The combination of these two brain chemicals reinforces a person's tendency, including the elderly, to continue consuming food in response to emotional distress (Pursey et al., 2014). Therefore, uncontrolled emotional eating behavior can lead to chronic energy overload and increase the risk of metabolic disorders.

CONCLUSION AND SUGGESTION

There is a significant correlation between levels of depression and emotional eating behavior and energy intake in the elderly at Payuban Lansia Srikandi, Kapasari Village, Surabaya City. The higher the levels of depression and emotional eating behavior, the lower the elderly's energy intake.

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CONFLICT OF INTEREST

There is no conflict of interest on this research.

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