

Body Mass Index Profile Among Older Adults with Type 2 Diabetes Mellitus in the Service Area of Kembangan Community Health Center, West Jakarta

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ABSTRACT

Body mass index (BMI) is an important anthropometric indicator for assessing nutritional status among older adults with type 2 diabetes mellitus. This study aimed to describe the BMI profile of older adults with type 2 diabetes mellitus in the service area of Kembangan Community Health Center, West Jakarta. This study employed a quantitative descriptive design. The study population consisted of 837 older adults with type 2 diabetes mellitus, from whom 89 respondents were recruited using accidental sampling. Data were collected through questionnaires and anthropometric measurements of body weight and height. BMI was calculated by dividing body weight in kilograms by the square of height in meters. The data were analyzed descriptively using frequency and percentage distributions. Of the 89 respondents, 46 (51.7%) were classified as having obesity, 40 (44.9%) had a normal BMI, and 3 (3.4%) were underweight. Obesity was the most prevalent BMI category among the respondents. More than half of the older adults with type 2 diabetes mellitus in this study were classified as having obesity. These findings highlight the importance of assessing BMI as part of nutritional status monitoring among older adults with type 2 diabetes mellitus. Further research is needed to examine factors associated with BMI categories in this population.

Keywords: Body Mass Index, Older Adults, Type 2 Diabetes Mellitus, Obesity.

I. Introduction

Diabetes mellitus is a major public health concern worldwide, particularly as populations age and the number of people living with chronic metabolic diseases continues to increase. The International Diabetes Federation estimated that 589 million adults aged 20–79 years were living with diabetes in 2024, and approximately 158.3 million people aged 65–99 years were affected by the disease (Magliano & Boyko, 2025). These figures highlight the substantial burden of diabetes among older adults and the need for appropriate long-term management. Diabetes mellitus is a chronic metabolic condition characterized by elevated blood glucose levels resulting from impaired insulin secretion, insulin action, or both. Its management requires more than glycemic control, including the assessment of nutritional status, physical functioning, and other health conditions that may influence treatment outcomes (American Diabetes Association Professional Practice Committee, 2025). Among the factors relevant to diabetes management, body weight and nutritional status deserve particular attention. Excess body fat is associated with metabolic dysfunction and an increased risk of

several chronic diseases, including type 2 diabetes mellitus (World Health Organization [WHO], 2024). Body mass index (BMI), calculated by dividing body weight in kilograms by the square of height in meters, is widely used to classify weight status in adult populations. According to the conventional adult classification, BMI values below 18.5 kg/m² indicate underweight, values from 18.5 to below 25 kg/m² indicate normal weight, values from 25 to below 30 kg/m² indicate overweight, and values of 30 kg/m² or higher indicate obesity (Centers for Disease Control and Prevention [CDC], 2024). Although BMI is useful for population-level assessment, it is a screening measure rather than a direct measurement of body fat or a comprehensive assessment of nutritional health.

The interpretation of BMI requires particular consideration in older adults. Aging is accompanied by changes in body composition, including reductions in muscle mass and strength, while excess adiposity may persist or increase. Consequently, a BMI value alone may not fully represent an older person's nutritional and functional condition. Older adults with diabetes may experience muscle loss, mobility limitations, frailty, and multiple coexisting health conditions, all of which can complicate disease management (American Diabetes Association Professional Practice Committee, 2025). Therefore, describing BMI categories in this population is relevant not only to identifying excess body weight but also to recognizing underweight status that may require further nutritional assessment. A descriptive assessment can provide an initial overview of weight-status patterns, although additional measures are necessary to evaluate muscle mass, fat distribution, and individual nutritional needs. In Indonesia, diabetes mellitus remains an important public health issue. The 2023 Indonesian Health Survey reported that the prevalence of diabetes based on physician diagnosis was 2.2% among people aged 15 years and older, while the prevalence based on blood glucose testing was 11.7%. The Special Capital Region of Jakarta had the highest prevalence based on physician diagnosis among all age groups, at 3.1% (Ministry of Health of the Republic of Indonesia, 2024). These figures demonstrate the importance of distinguishing between diagnosed diabetes and diabetes identified through biochemical screening. They also indicate that national and provincial statistics provide essential epidemiological context, but they do not necessarily describe the nutritional status of older adults receiving care at a particular community health center.

Indonesian studies have examined diabetes-related characteristics and risk factors in different populations. Harjatmo et al. (2023), for example, investigated BMI and other risk factors for diabetes mellitus among older adults attending Pancoran Community Health Center in South Jakarta. Their findings identified BMI and daily sugar consumption as significant risk factors in that study population. Similarly, Soeatmadji et al. (2023) described the clinical and demographic characteristics, treatment patterns, and outcomes of patients with type 2 diabetes mellitus in the Indonesian DISCOVER cohort. These studies contribute to the understanding of diabetes in Indonesia; however, their research settings, populations, and analytical objectives differ from a descriptive assessment of BMI categories among older adults with established type 2 diabetes mellitus in the Kembangan Community Health Center service area. The importance of examining this population is also supported by evidence that older adults with diabetes have healthcare needs extending beyond metabolic measurements. Asshiddiqi et al. (2021) examined factors associated with diabetes distress among older people with type 2 diabetes mellitus in Indonesia, demonstrating the relevance of age-specific considerations in diabetes management. Furthermore, Nuridzin et al. (2024) examined factors associated with diabetes prevalence in Indonesia using an ecological analysis, illustrating the contribution of population-level evidence to understanding the national distribution of the disease. Nevertheless, findings from other locations or population-level analyses cannot substitute for a local description of BMI categories among older adults receiving diabetes care in Kembangan.

A specific evidence gap addressed by the present study is the limited availability, within the evidence considered here, of a clearly documented description of BMI categories among older adults with type 2 diabetes mellitus in the service area of Kembangan Community Health Center, West Jakarta. This gap should be understood as a local descriptive gap rather than evidence that no previous studies have examined BMI and diabetes in Indonesia. Local data are useful for identifying the distribution of normal weight, underweight, and obesity within the population studied and may provide an initial basis for discussing nutritional

assessment in primary healthcare settings. Because BMI categories alone cannot establish causal relationships or determine individual clinical needs, the findings should be interpreted within the descriptive scope of the research. Accordingly, this study aimed to describe the body mass index profile of older adults with type 2 diabetes mellitus in the service area of Kembangan Community Health Center, West Jakarta. Using a quantitative descriptive design, the study examined BMI categories among 89 respondents selected through accidental sampling. The findings are intended to provide a local overview of BMI distribution among the respondents and contribute descriptive information that may support further research and the consideration of nutritional status assessment in older adults receiving care for type 2 diabetes mellitus.

II. Literature Review

2.1. Body Mass Index as an Indicator of Nutritional Status

Body mass index (BMI) is a commonly used anthropometric indicator for classifying body weight relative to height. It is calculated by dividing body weight in kilograms by the square of height in meters (World Health Organization [WHO], 2025). Its simplicity, affordability, and suitability for population-level assessment make BMI useful in clinical and public health settings. Nevertheless, BMI is an indirect indicator of body composition and cannot independently distinguish fat mass from lean mass or identify the distribution of body fat (American Diabetes Association Professional Practice Committee, 2025a). Consequently, BMI should be interpreted as a screening measure rather than a comprehensive assessment of nutritional health.

Under conventional adult classifications, BMI below 18.5 kg/m² indicates underweight, 18.5–24.9 kg/m² indicates normal weight, 25.0–29.9 kg/m² indicates overweight, and 30.0 kg/m² or higher indicates obesity (WHO, 2025). These categories provide a standardized framework for describing weight status, but interpretation should consider population characteristics and clinical context. Research has shown that the relationship between BMI, body fat, and metabolic risk varies across Asian populations, and health risks may become evident at lower BMI values than those commonly associated with overweight in European populations (WHO Expert Consultation, 2004). Therefore, researchers should identify the classification criteria used in their analyses and avoid assuming that BMI alone fully captures an individual's metabolic or nutritional condition.

2.2. Type 2 Diabetes Mellitus and Body Weight

Type 2 diabetes mellitus is a chronic metabolic disorder characterized by persistent hyperglycemia associated with impaired insulin secretion, insulin action, or both. Insulin resistance and progressive pancreatic beta-cell dysfunction are central to its pathophysiology (DeFronzo, 2009; Kahn et al., 2006). Excess adiposity is associated with insulin resistance and an increased risk of developing type 2 diabetes, although the relationship is influenced by genetic, behavioral, environmental, and metabolic factors (American Diabetes Association Professional Practice Committee, 2025b; WHO, 2025). Accordingly, body weight is an important consideration in diabetes prevention and management, but obesity should not be treated as the sole explanation for the disease. For people already living with type 2 diabetes, nutritional assessment supports individualized management. Evidence-based recommendations emphasize appropriate dietary patterns, energy balance, physical activity, and weight management according to individual circumstances and treatment goals (Evert et al., 2019). The American Diabetes Association also recommends monitoring anthropometric measures and considering weight management as part of diabetes care for people with overweight or obesity (American Diabetes Association Professional Practice Committee, 2025b). These recommendations support the relevance of describing BMI categories among older adults receiving care for type 2 diabetes mellitus. However, the association between BMI and diabetes does not mean that a descriptive study of BMI can establish causal relationships. A cross-sectional or descriptive assessment can identify the distribution of weight categories in a particular population, but it cannot determine whether BMI caused

diabetes or whether a specific BMI category explains differences in glycemic control. This distinction is essential when interpreting research focused on BMI among patients with an established diagnosis of type 2 diabetes mellitus.

2.3. BMI and Nutritional Status in Older Adults

BMI requires particular consideration in older adults because aging is accompanied by changes in body composition, physical function, and nutritional requirements. Older people may experience declining muscle mass and strength, changes in appetite, reduced food intake, and increased vulnerability to malnutrition. At the same time, excess body fat may coexist with reduced muscle mass, meaning that a normal or elevated BMI does not necessarily indicate adequate nutritional status or preserved physical function (Cruz-Jentoft et al., 2019; Volkert et al., 2022). Sarcopenia, characterized by reduced muscle strength and muscle quantity or quality, is an important consideration in geriatric assessment. The European Working Group on Sarcopenia in Older People emphasizes muscle strength as a key characteristic and recommends further assessment of muscle quantity, quality, and physical performance when sarcopenia is suspected (Cruz-Jentoft et al., 2019). Thus, BMI provides useful information about weight relative to height but should not be used as a substitute for direct assessment of muscle function or nutritional status. Older adults with diabetes may face additional challenges because diabetes is associated with reduced muscle strength, accelerated muscle loss, frailty, and other age-related health problems (American Diabetes Association Professional Practice Committee, 2026). Clinical nutrition guidance therefore emphasizes adequate nutritional intake, individualized dietary management, and physical activity appropriate to the person's functional capacity (Volkert et al., 2022). Both obesity and underweight warrant attention because nutritional management in older adults must balance metabolic health with the preservation of muscle mass, mobility, and independence.

2.4. Evidence from Indonesia and the Need for Local Assessment

Diabetes mellitus remains an important health concern in Indonesia, and national health surveys provide essential information about its distribution. The Indonesian Health Survey 2023 distinguishes diabetes prevalence based on physician diagnosis from prevalence identified through blood glucose testing, demonstrating the importance of specifying the diagnostic basis when interpreting epidemiological estimates (Ministry of Health of the Republic of Indonesia, 2024). Such national statistics establish the broader context for diabetes research, but they do not necessarily describe the BMI distribution of older adults with diagnosed type 2 diabetes at an individual primary healthcare facility.

Research in Indonesia has examined BMI and other risk factors associated with diabetes among older adults. Harjatmo et al. (2023), for example, investigated BMI and other risk factors for diabetes mellitus among older adults attending Pancoran Community Health Center in South Jakarta. Their study provides a relevant local comparison, although its population and analytical focus differ from a descriptive assessment restricted to older adults already diagnosed with type 2 diabetes mellitus. In addition, the Indonesian DISCOVER cohort documented clinical and demographic characteristics and treatment patterns among people with type 2 diabetes, contributing evidence about the diversity of diabetes care in Indonesia (Soeatmadji et al., 2023). These studies demonstrate the value of local and population-specific evidence. However, findings from other health facilities cannot automatically be generalized to Kembangan Community Health Center because patient characteristics, healthcare access, and the composition of the study population may differ. A site-specific description of BMI categories can therefore complement existing Indonesian evidence without claiming that the broader relationship between BMI and diabetes remains unexplored.

2.5. Conceptual Position and Research Relevance

The present study treats BMI category as the principal descriptive variable among older adults with type 2 diabetes mellitus. Its conceptual basis is that BMI provides a practical overview of weight status, while its interpretation in older adults requires awareness of age-related changes in body composition and nutritional vulnerability (Cruz-Jentoft et al., 2019; Volkert et al., 2022). The study does not assume that BMI categories independently explain diabetes occurrence, disease severity, or clinical outcomes. The specific evidence gap addressed is the need for a clearly documented local description of BMI categories among older adults with type 2 diabetes mellitus in the service area of Kembangan Community Health Center, West Jakarta. This is a local descriptive gap rather than a claim that no previous Indonesian research has examined BMI and diabetes. By documenting the distribution of BMI categories among the respondents, the study provides information that may inform further investigation and support discussion of nutritional assessment in primary healthcare settings. Its findings should be interpreted within the limits of the descriptive design and the sampling method used.

III. Research Method

3.1. Research Design

This study employed a quantitative descriptive design to describe the body mass index (BMI) profile of older adults with type 2 diabetes mellitus in the service area of Kembangan Community Health Center, West Jakarta. The analysis focused on the distribution of BMI categories and the demographic characteristics of the respondents.

3.2. Population and Sample

The study population consisted of 837 older adults with type 2 diabetes mellitus in the service area of Kembangan Community Health Center, West Jakarta. A total of 89 respondents participated in the study. Participants were recruited using accidental sampling. Eligible participants were older adults with type 2 diabetes mellitus who attended the Older Adult Clinic during the data collection period and whose body weight and height could be measured.

3.3. Research Instruments and Data Collection

Data were collected from July 26 to August 2, 2024, at the Older Adult Clinic of Kembangan Community Health Center, West Jakarta. The data collection instruments included a questionnaire, a weighing scale, and a height-measuring device. The questionnaire was administered directly to respondents, while body weight and height were measured to obtain the anthropometric data required for BMI calculation. BMI was calculated by dividing body weight in kilograms by the square of height in meters:

$$\text{BMI} = \text{weight (kg)} / [\text{height (m)}]^2.$$

The measurement results were recorded on an observation sheet and subsequently organized for descriptive analysis. The BMI classification criteria applied in the study should be specified according to the reference used by the researchers.

3.4. Data Analysis

The data were analyzed using the Statistical Package for the Social Sciences (SPSS). Univariate descriptive analysis was conducted to summarize respondents' characteristics, including sex and employment status, as well as their BMI categories. The results were presented as frequency distributions and percentages to describe the characteristics of the study participants and the distribution of BMI categories.

3.5. Instrument Quality and Ethical Considerations

The study manuscript describes validity and reliability as considerations in evaluating research instruments. However, the specific procedures and results of these assessments need to be documented if the tests were conducted. The instruments used to measure body weight and height should be described in terms of their measurement procedures and relevant quality-control practices. Information regarding ethical approval, informed consent, and procedures for protecting respondents' confidentiality should also be provided according to the actual procedures followed during the study.

IV. Result and Discussion

4.1. Results

a. Respondent Characteristics

A total of 89 older adults with type 2 diabetes mellitus participated in this study. As presented in Table 1, 30 respondents (33.7%) were male and 59 (66.3%) were female. Regarding employment status, 4 respondents (4.5%) were employed, whereas 85 (95.5%) were not employed.

Table 1. Distribution of Respondent Characteristics (n = 89)

Characteristic	Frequency (n)	Percentage (%)
Sex		
Male	30	33.7
Female	59	66.3
Employment status		
Employed	4	4.5
Not employed	85	95.5
Total	89	100.0

b. Body Mass Index Categories

Table 2 presents the distribution of BMI categories among the 89 respondents. The largest group consisted of respondents classified as overweight or obese according to the study's operational classification, accounting for 46 respondents (51.7%). A normal BMI was recorded for 40 respondents (44.9%), while 3 respondents (3.4%) were classified as underweight.

Table 2. Distribution of BMI Categories Among Older Adults With Type 2 Diabetes Mellitus (n = 89)

BMI category	Frequency (n)	Percentage (%)
Normal	40	44.9
Underweight	3	3.4
Overweight/obese*	46	51.7
Total	89	100.0

4.2. Discussion

a. Respondent Characteristics and Their Interpretation

Women constituted 66.3% of the respondents, while 95.5% were not employed. These figures describe the composition of the study sample rather than demonstrating that sex or employment status is associated with a particular BMI category. Without cross-tabulation or an appropriate statistical analysis, it is not possible to determine whether women were more likely than men to have overweight or obesity, or whether respondents who were not employed had lower physical activity levels. Nevertheless, sex and employment status provide useful contextual information for interpreting the sample. Research involving older Indonesians with diabetes has examined the relationship between physical-activity self-efficacy, sedentary behavior, and BMI, highlighting the importance of considering behavioral factors when interpreting weight status (Rachmah et al., 2019). Employment status alone, however, cannot be used as a proxy for physical activity because older adults who are not employed may still engage in walking, household activities, caregiving, or other forms of movement. The predominance of female respondents may reflect the characteristics of patients attending the health center during the study period. It should not be interpreted as evidence of a higher prevalence of obesity among women because the study did not report BMI distributions separately by sex. Further research using sex-stratified analyses could clarify whether BMI categories differ between male and female patients in this setting.

b. BMI Distribution Among Older Adults With Type 2 Diabetes Mellitus

The principal finding was that 46 respondents (51.7%) were classified in the study's highest BMI category, compared with 40 (44.9%) with a normal BMI and 3 (3.4%) who were underweight. This distribution indicates that the overweight/obese category was the most common among the participants. However, because the study used a descriptive design, the result should be interpreted as a distribution within the sampled population rather than evidence that excess BMI caused diabetes mellitus. The relationship between adiposity and type 2 diabetes is well established in epidemiological research. A systematic review and dose-response meta-analysis by Jayedi et al. (2022) found a positive association between BMI and the risk of developing type 2 diabetes. This relationship is biologically plausible because excess adiposity can contribute to insulin resistance and metabolic dysfunction (Kahn et al., 2006; DeFronzo, 2009). Broader evidence also indicates that overweight and obesity contribute to the burden of noncommunicable diseases across populations (Afshin et al., 2017; World Health Organization [WHO], 2025).

These findings provide a rationale for assessing BMI among people with established type 2 diabetes, but they must be distinguished from the present study's objective. Jayedi et al. (2022) examined the risk of developing diabetes, whereas the current study describes BMI categories among respondents who already had the disease. Accordingly, the present results cannot establish the direction of the relationship between BMI and diabetes, nor can they identify the causes of the observed distribution. Research in Indonesia provides a useful comparison. Harjatmo et al. (2023) examined BMI and other risk factors for diabetes among older adults attending a community health center in South Jakarta. Rachmah et al. (2019) also investigated BMI in relation to physical-activity self-efficacy and sedentary behavior among older Indonesians with diabetes. These studies demonstrate the relevance of examining weight status and behavior in Indonesian older adults. Nevertheless, differences in study populations, settings, sampling procedures, and research objectives mean that their findings should not be treated as directly equivalent to the distribution observed in Kembangan.

c. BMI as a Screening Measure in Older Adults

Although BMI is widely used to classify weight status, it does not directly measure body fat or distinguish adipose tissue from muscle mass. The WHO (2025) identifies BMI as a practical measure for assessing overweight and obesity, while recognizing that other anthropometric measures may provide additional information. This limitation is particularly relevant to older adults because aging can involve reductions in muscle mass and strength alongside changes in fat distribution. The European Working Group on Sarcopenia in Older People emphasizes that muscle strength and muscle quantity or quality require consideration in the assessment of sarcopenia (Cruz-Jentoft et al., 2019). Similarly, the Global Leadership Initiative on Malnutrition provides diagnostic criteria that consider factors beyond BMI alone when identifying malnutrition (Cederholm et al., 2019). These perspectives indicate that a normal BMI does not necessarily

exclude nutritional problems, while a high BMI does not provide a complete assessment of muscle function or metabolic health.

Clinical recommendations for older adults with diabetes therefore emphasize individualized nutritional management, adequate protein intake, and physical activity appropriate to functional capacity (Evert et al., 2019; American Diabetes Association Professional Practice Committee, 2025). The 2026 Standards of Care in Diabetes also emphasize nutritional adequacy, physical activity, and the preservation of lean body mass in older adults (American Diabetes Association Professional Practice Committee, 2026). These recommendations support the importance of interpreting BMI within a broader assessment of nutritional and functional health. The relatively small proportion of underweight respondents in this study, 3.4%, should not be interpreted as evidence that undernutrition is unimportant. Older adults with diabetes may experience both excess adiposity and loss of muscle mass. Research on sarcopenic obesity emphasizes that excess body fat and low muscle mass can coexist and may complicate health assessment in older populations (Batsis & Villareal, 2018). Clinical nutrition guidance for older people likewise stresses the need to identify both inadequate nutritional intake and excessive or inappropriate weight gain (Volkert et al., 2022).

V. Conclusion

This study found that the largest BMI category among the 89 older adults with type 2 diabetes mellitus was the overweight/obese category, comprising 46 respondents (51.7%). A normal BMI was recorded in 40 respondents (44.9%), while 3 respondents (3.4%) were classified as underweight. Women accounted for 59 respondents (66.3%), and 85 respondents (95.5%) were not employed. These findings provide a descriptive overview of BMI categories and respondent characteristics in the study population at Kembangan Community Health Center, West Jakarta. The findings highlight the importance of assessing nutritional status among older adults receiving care for type 2 diabetes mellitus. BMI assessment may help identify individuals who require further evaluation of weight status and nutritional needs. However, BMI should not be interpreted as a comprehensive measure of nutritional health because it does not distinguish fat mass from muscle mass or capture physical function. Nutritional assessment and subsequent care should therefore consider individual clinical conditions, dietary intake, physical activity, and functional capacity. This study has limitations, including its descriptive design, the use of accidental sampling, and the absence of analyses examining associations between BMI categories and respondent characteristics. Therefore, the findings should not be generalized beyond the study population without caution. Future research should use larger and more systematically selected samples and incorporate additional measures, such as waist circumference, nutritional status, physical activity, muscle strength, and glycemic control. Analytical studies may also investigate factors associated with BMI categories among older adults with type 2 diabetes mellitus to provide a stronger evidence base for individualized nutritional assessment and primary healthcare interventions.

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