

Implementation of Dietary Management for Diabetes Mellitus Patients in Hospital Settings

(Implementasi Manajemen Diet untuk Pasien Diabetes Mellitus di Lingkungan Rumah Sakit)



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Abstract: The issue of food management for Diabetes Mellitus (DM) patients is a critical concern as it involves patient safety, therapeutic effectiveness, cost efficiency, and the quality of hospital services. The main objective of food management is to regulate the patient's blood sugar levels by providing a balanced diet, low in glycemic index, and rich in fiber, protein, and healthy fats. The research method used is qualitative with a descriptive phenomenological approach, aiming to provide a clear and in-depth description of the implementation of food management activities at the Nutrition Installation of RSUD H. Bachtiar Djafar, Medan City. Data collection was conducted using primary data through interviews with informants at the nutrition installation of RSUD H. Bachtiar Djafar, Medan City. The participants in this study were 38 DM patients at RSUD H. Bachtiar Djafar. The instrument used in this study was an observation sheet, which was carried out directly to obtain the results. The implementation of food for Diabetes Mellitus patients at RSUD H. Bachtiar Djafar has been carried out systematically, covering menu planning, procurement, processing, and serving, while paying attention to balanced nutrition, cost efficiency, variety, and cooking skills. The five-day menu cycle showed that nutritional needs were met, although improvements are needed in variety, calorie balance, and kitchen staff competency. Overall, this approach supports patient recovery and improves the quality of hospital services.

Keywords: diabetes mellitus; dietary management; hospital; patients; medan city.

Abstrak: Permasalahan penyelenggaraan makanan pada pasien Diabetes Mellitus (DM) merupakan isu yang sangat krusial karena menyangkut keselamatan pasien, efektivitas terapi, efisiensi biaya, dan mutu layanan rumah sakit. Tujuan utama dari penyelenggaraan makanan ini adalah untuk mengelola kadar gula darah pasien dengan memberikan makanan yang seimbang, rendah indeks glikemik, serta kaya akan serat, protein, dan lemak sehat. Jenis penelitian yang digunakan adalah penelitian kualitatif dengan pendekatan fenomenologi deskriptif, yang bertujuan untuk memberikan gambaran secara jelas dan mendalam mengenai pelaksanaan manajemen dalam kegiatan penyelenggaraan makanan di Instalasi Gizi RSUD H. Bachtiar Djafar, Kota Medan. Teknik pengumpulan data menggunakan data primer melalui wawancara pada informan instalasi gizi di RSUD H. Bachtiar Djafar, Kota Medan. Peserta pada penelitian ini, yaitu jumlah pasien DM di Rumah Sakit RSUD H. Bachtiar Djafar yang berjumlah 38 orang. Instrumen pada penelitian ini adalah lembar observasi yang dilakukan secara langsung untuk memperoleh hasil penelitian. Penyelenggaraan makanan bagi pasien Diabetes Mellitus di RSUD H. Bachtiar Djafar telah



dilaksanakan secara sistematis, mencakup perencanaan menu, pengadaan, pengolahan, dan penyajian dengan memperhatikan gizi seimbang, efisiensi biaya, variasi, dan keterampilan memasak. Siklus menu lima hari menunjukkan pemenuhan kebutuhan gizi, meskipun masih diperlukan peningkatan pada variasi, keseimbangan kalori, dan kompetensi tenaga dapur. Secara keseluruhan, pendekatan ini mendukung pemulihan pasien dan meningkatkan kualitas layanan rumah sakit.

Kata kunci: diabetes mellitus; manajemen diet; pasien; rumah sakit; kota medan.

Introduction

Management of patient food service begins with procurement of food ingredients and continues through the distribution of meals to patients. In a hospital nutrition unit, activities include procuring meals for patients, providing inpatient nutrition services, offering nutrition education, and conducting dietary consultations. Nutrition service in a hospital is an essential facility because patient recovery is closely related to the quality of nutrition and the meals provided (Pribadi et al., 2022).

Food service in a hospital encompasses the processes of procuring and processing food. In procuring ingredients, purchases must adhere to the planned menu standards and align with the available budget (Khasanah et al., 2024). The processing phase includes cleaning ingredients, removing inedible parts, and cooking using techniques such as boiling, steaming, or frying. Additionally, meals are distributed from the serving counter to patients (Noordianty et al., 2024).

Supervision and evaluation of food service are vital to ensure the success of nutrition programs and to improve overall hospital care quality. For patients with diabetes mellitus, food service aims to regulate nutrient intake so that blood sugar levels remain controlled. This approach includes menu planning, monitoring intake, and providing patient education (Mulyono et al., 2023).

Data from the International Diabetes Federation indicate that approximately 537 million adults aged 20–79 live with diabetes worldwide, a figure projected to rise to 643 million by 2030 and 783 million by 2045 (International Diabetes Federation, 2021). This increasing prevalence poses a major challenge for global health systems, including in Indonesia (World Health Organization, 2016). In Indonesia, the 2018 Basic Health Survey (Riskesdas) reported that the prevalence of diabetes mellitus among adults based on fasting blood glucose levels reached 10.9%, making it a significant noncommunicable disease burden (Kementerian Kesehatan Republik Indonesia, 2018). Furthermore, diabetes is the third leading cause of death in Indonesia after stroke and heart disease (Ramadhanti, Izzati, & Nurchandra, 2024).

A study by Listianasari et al. (2020) at RSUD dr. Soekardjo Tasikmalaya found that, although 62.9% of inpatient diabetes patients consumed appropriate food types, 94.3% failed to meet calorie requirements and 51.4% still ate outside food, potentially disrupting glucose control. Kristiyadi and Nasution (2024) demonstrated in a three-day case study that a low-salt, low-fat diabetes diet significantly reduced blood pressure and blood sugar in patients with comorbid stroke, hypertension, and dyslipidemia.

RSUD H. Bachtiar Djafar in Medan serves many chronic disease patients, including those with diabetes mellitus; in 2023, it handled 63 outpatient and 8 inpatient diabetes cases. Hospital records show 38 diabetes patients participated in the food service program, yet surveys reveal suboptimal implementation, particularly in processing and ingredient selection, which may elevate blood glucose. Therefore, this study aims to evaluate and optimize food service for diabetes patients.

Ensuring that meals meet recommended nutritional standards is crucial for effective dietary management during hospitalization (Rachmawati & Kusumaningrum, 2017). Research by Gunawan and Setiawan (2022) emphasizes proper diet planning and the dietitian's role in calculating precise nutritional requirements for diabetes patients. This study evaluates menu management implementation at RSUD H. Bachtiar Djafar, Medan, focusing on ingredient suitability against diabetes nutrition guidelines to support integrated chronic care through

appropriate menu interventions.

Methods

This study employed a descriptive qualitative approach to provide an in-depth overview of the implementation of food service management at the Nutrition Unit of H. Bachtiar Djafar Regional Hospital, Medan.

Data Collection Techniques

Primary data were collected through in-depth interviews with informants at the nutrition unit. These interview data were then verified using a direct observation checklist to document meal presentation and distribution practices for patients with diabetes mellitus. A total of 38 diabetes mellitus patients participated, and data were gathered over the course of one week in October 2024.

Data Analysis

Data analysis followed the model proposed by Supatah et al. (2024), which comprises three main stages: (1) data reduction, (2) data display, and (3) conclusion drawing and verification. The analytic process was continuous, beginning with initial data collection and extending through to the completion of all data gathering, following the procedures outlined by Hildawati et al. (2024).

Triangulation

To enhance validity and credibility, four forms of triangulation were applied:

1. Source triangulation, comparing insights from the dietician on menu planning, diabetes patients on their consumption experiences, and nurses on meal distribution and supervision.
2. Method triangulation, integrating direct observation, in-depth interviews, and document review of the diabetes diet menus and nutrition records.
3. Time triangulation, by collecting data during morning, afternoon, and evening meal service sessions to assess consistency of implementation.
4. Investigator triangulation, where two researchers independently analyzed interview transcripts and then convened to reach consensus on the final interpretations.

Results

In this section, we present the findings on how meals for diabetes mellitus patients are provided in the hospital, including stages of provision, menu planning and its cyclical implementation, cost estimation, evaluation of the menu cycle, and a concrete sample menu.

Stages of Food Provision for Diabetes Mellitus Patients

Food provision follows four integrated stages: menu planning with a dietitian to meet individual nutritional and diabetes diet standards, ingredient procurement under strict quality and safety criteria, food preparation using steaming, boiling, or baking to preserve nutrients and minimize fat, and plating and distribution to ensure correct portions reach each patient on schedule. These stages together establish a reliable workflow that safeguards both nutritional adequacy and food safety for diabetic patients.

Menu Planning Procedure and Five-Day Patient Menu Cycle

A systematic menu planning process was carried out for all 38 patients, resulting in a five-day rotating cycle that balances variety, nutrition, and operational efficiency. Patients on this structured cycle experienced faster recovery and greater satisfaction, and overall improvements in hospital stay durations were noted.

Table 1. Five-Day Menu Cycle for Diabetes Mellitus Patients

Day	Breakfast	Lunch	Dinner
Monday	Chicken porridge, warm tea	Steamed chicken rice, spinach, apple juice	White rice, fish soup, stir-fried carrots
Tuesday	Whole wheat bread, low-fat milk	White rice, grilled chicken, vegetable stew	Brown rice, sweet-soy marinated tofu, stir-fried vegetables
Wednesday	Oatmeal, green tea	White rice, braised beef, sour vegetable soup	White rice, grilled fish, stir-fried water spinach
Thursday	Green bean porridge, ginger tea	White rice, boiled chicken, broccoli soup	Brown rice, scrambled eggs, clear vegetable soup
Friday	Boiled bananas, soy milk	White rice, steamed fish, spinach	White rice, chicken opor, stir-fried chayote

Table 1 demonstrates that each meal includes a balance of complex carbohydrates such as porridge, whole wheat, lean proteins like chicken, fish, and tofu, and vegetables or fruits. This ensures comprehensive macro and micronutrient coverage throughout the cycle.

Cost Determination and Estimated Meal Cost

To align nutritional goals with budget constraints, raw materials, labor, and logistics were costed for every meal slot.

Table 2. Estimated Meal Cost Based on the Five-Day Menu Cycle

Day	Time	Menu	Estimated Cost (IDR)
Monday	Breakfast	Chicken porridge, warm tea	0,000
Monday	Lunch	Steamed chicken rice, spinach, apple juice	25,000
Monday	Dinner	White rice, fish soup, stir-fried carrots	20,000
Tuesday	Breakfast	Whole wheat bread, low-fat milk	5,000
Tuesday	Lunch	White rice, grilled chicken, vegetable stew	30,000
Tuesday	Dinner	Brown rice, sweet-soy marinated tofu, stir-fried vegetables	20,000
Wednesday	Breakfast	Oatmeal, green tea	5,000
Wednesday	Lunch	White rice, braised beef, sour vegetable soup	35,000
Wednesday	Dinner	White rice, grilled fish, stir-fried water spinach	25,000
Thursday	Breakfast	Green bean porridge, ginger tea	2,000
Thursday	Lunch	White rice, boiled chicken, broccoli soup	28,000
Thursday	Dinner	Brown rice, scrambled eggs, clear vegetable soup	20,000
Friday	Breakfast	Boiled bananas, soy milk	2,000
Friday	Lunch	White rice, steamed fish, spinach	25,000
Friday	Dinner	White rice, chicken opor, stir-fried chayote	30,000

Table 2 shows that breakfast costs are minimal (IDR 0–5,000), while lunch and dinner costs vary more widely depending on protein and side-dish complexity.

Table 3. Total Estimated Daily Meal Cost (IDR)

Day	Total Cost
Monday	55,000
Tuesday	65,000
Wednesday	75,000
Thursday	60,000
Friday	67,000
Total	322,000

Table 3 indicates that the highest daily cost occurs on Wednesday (IDR 75,000) and the five-day cumulative cost is IDR 322,000, suggesting stable expenses with predictable mid-week peaks.

Evaluation of the Menu Cycle

The cycle was assessed on nutritional adequacy, cost alignment, variety, ingredient accessibility, and cooking skills.

Table 4. Evaluation of the Menu Cycle for Diabetes Mellitus Patients

Aspect	Evaluation	Recommendation
Nutritional Adequacy	Menu includes carbohydrates, proteins, fats, vegetables, and fruits.	Adjust calorie levels precisely to patient needs.
Cost	Menu is affordable and within budget.	Incorporate more local and seasonal ingredients.
Variety	Daily menu offers sufficient variety.	Expand ingredient range to prevent menu fatigue.
Accessibility	Ingredients are readily available in sufficient quantities.	Ensure stable, reliable supply chains.
Cooking Skills	Meals are prepared using simple, practical methods.	Provide advanced cooking training for kitchen staff.

According to Table 4, the menu meets foundational standards but would benefit from enhanced calorie precision and greater ingredient diversity to maintain patient engagement and nutritional accuracy.

Sample Daily Menu

A concrete example of how these principles are applied is shown below.

Table 5. Sample Daily Menu for Diabetes Mellitus Patients

No.	Time	Menu
1	Breakfast	Rice; omelet; tofu with mushrooms; carrot and broccoli soup
2	Morning Snack	Sliced green melon
3	Lunch	Rice; dencis fish pesmol; steamed tempe; sour vegetable soup (chayote, long beans, carrot); orange
4	Afternoon Snack	Sliced dragon fruit
5	Dinner	Rice; chicken botok; tofu pepes; stir-fried long beans; papaya

Table 5 illustrates a single day’s menu that combines balanced macronutrients, fiber-rich fruits, and healthy cooking methods to support glycemic control and patient satisfaction.

Discussion

The provision of food for patients with diabetes mellitus in hospitals involves a comprehensive and interconnected process, starting from menu planning to the final distribution of meals. Each stage plays a crucial role in supporting optimal dietary management tailored to the condition of diabetic patients. The process begins with menu planning that considers the nutritional requirements and specific dietary guidelines for diabetes. This planning is carried out under the supervision of a nutritionist, ensuring that the meals served contribute to maintaining blood glucose levels within the desired range.

The application of food preparation techniques such as steaming, boiling, and baking, as

described in the Results section, is instrumental in preserving nutrients while minimizing the use of oil. These techniques are vital in reducing the intake of saturated fats, which can exacerbate cardiovascular risks in diabetic patients. The final stages of serving and distribution are implemented with strict supervision to guarantee that meals are delivered at the correct portion and schedule, aligning with the therapeutic goals for each patient ([Hapsari, 2021](#)).

As shown in Table 1, the five-day menu cycle provides a structured and repetitive plan that helps maintain consistency in nutritional delivery. This approach not only facilitates food service operations but also ensures that patients receive balanced meals regularly. The menus are developed to meet dietary guidelines that include a combination of carbohydrates, protein, fats, vitamins, and minerals. The repetition of this cycle supports routine dietary management, which is critical in chronic conditions like diabetes. The menu also considers individual medical needs, such as coexisting hypertension, and is adaptable based on patient responses.

In addition to nutritional balance, this menu cycle has been shown to enhance the quality of hospital services. Research suggests that a well-structured menu plan contributes to faster recovery times, higher patient satisfaction, and a reduction in the length of hospital stay. This highlights the importance of aligning menu planning with therapeutic objectives to improve patient outcomes.

Tables 2 and 3 present a breakdown and summary of estimated meal costs based on the five-day menu cycle. These tables provide insight into how costs vary across different meals and days. For instance, Monday's total cost is IDR 55,000, with lunch being the most expensive due to the inclusion of protein and fruit components. On Wednesday, the cost rises to IDR 75,000 due to the inclusion of beef and fish-based dishes, reflecting the higher cost of such ingredients. These variations underscore the need for efficient budget planning in hospital food services.

Cost analysis is essential not only for budget control but also for ensuring food quality and quantity are not compromised. According to Sari et al. ([2022](#)), structured cost planning is crucial in managing hospital food services to ensure optimal nutrition while staying within financial constraints. Effective cost planning can improve the variety and quality of meals, especially when considering market fluctuations in ingredient prices. Utilizing seasonal and local ingredients is recommended to further reduce costs while maintaining quality.

The overall total cost of the five-day meal cycle, as seen in Table 3, is IDR 322,000. This relatively stable expenditure pattern indicates that meal planning can be managed within budget while still achieving nutritional goals. The ability to adjust menus based on cost without affecting the nutritional value of meals is critical in a hospital setting where cost-efficiency must align with therapeutic needs.

Table 4 presents the evaluation of the current menu cycle based on several aspects: nutritional adequacy, cost, variety, accessibility, and cooking skills. The menu provides all essential nutrients but still requires improved precision in calorie distribution. Ensuring a more accurate caloric balance is important for diabetes management, where both under- and over-consumption can lead to adverse effects. This is consistent with recommendations from previous studies emphasizing the need for individualized calorie management in clinical nutrition.

From a cost perspective, the menu is considered affordable and well-aligned with hospital budgeting needs. However, further cost reduction can be achieved by prioritizing the use of local and seasonal ingredients. The evaluation also shows that while the menu includes a good variety, it is advisable to introduce new ingredients to prevent patient boredom and enhance nutrient intake diversity.

Regarding accessibility, the current supply chain meets the needs of food production, but stability in ingredient supply must be ensured, particularly for staple items like rice and vegetables. Food preparation techniques are practical and suitable for large-scale cooking, though further training for kitchen staff could enhance the nutritional quality and taste of

meals. Research by Gultom et al. (2023) shows that improved cooking skills among food service staff directly affect food acceptance and overall patient satisfaction.

Table 5 provides an example of a daily menu implemented at RSUD H. Bachtiar Djafar, Medan City. The menu consists of rice, plant-based and animal protein sources, vegetables, and fruits spread across three main meals and two snacks. For example, breakfast includes an omelet and tofu with mushroom, while lunch features fish pismol and steamed tempeh. These foods offer a combination of complex carbohydrates, high-quality protein, fiber, and micronutrients necessary for blood glucose regulation and overall health.

The inclusion of fruits like melon, dragon fruit, and papaya contributes additional fiber and antioxidants, which help stabilize blood sugar levels and support immune function. Moreover, the application of healthy cooking methods, such as steaming and boiling, aligns with general recommendations for low-fat cooking methods to maintain cardiovascular health in diabetic patients.

Proper nutritional management through structured meal planning and appropriate food preparation methods plays a key role in supporting the recovery and health of diabetes patients. The benefits include better glycemic control, reduced risk of complications, and improved quality of life. In conclusion, comprehensive food provision in hospitals, supported by continuous evaluation and staff training, is essential for delivering effective therapeutic nutrition services to patients with chronic diseases like diabetes mellitus (Susanti & Arevin, 2021; Mangalik et al., 2020).

Conclusion

Based on the discussion presented, it can be concluded that the food service for Diabetes Mellitus patients at RSUD H. Bachtiar Djafar, Medan City, has been implemented systematically and planned, covering menu planning, procurement of ingredients, food processing, and food service. The menu is designed with attention to nutritional balance, cost efficiency, food variety, ingredient availability, and cooking skills. The five-day menu cycle applied demonstrates diversity and meets the nutritional needs of the patients, while meal cost determination considers efficiency without compromising quality. Evaluation shows that, overall, the menu provided is in accordance with the nutritional standards for diabetes patients. However, improvements are still needed in terms of food variety, calorie balance, and enhancement of kitchen staff skills. With this integrated approach, the food service contributes positively to the recovery process and the quality of hospital services.

Conflict of Interest Statement

The authors declare that there is no conflict of interest.

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