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Self-Care Overview for Type 2 Diabetes Mellitus Patients in Pekanbaru City

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ABSTRACT

Background: *Self-care is a critical component in the management of Type 2 Diabetes Mellitus (T2DM). The chronic nature of diabetes necessitates that patient actively engage in managing their disease, focusing on lifestyle modifications, medication adherence, and regular monitoring of health indicators. Programs that promote self-care can help reduce feelings of distress and improve overall quality of life by fostering independence and self-efficacy in managing diabetes*

Purpose: *The researcher is interested in conducting research on the description of self-care for type 2 diabetes mellitus patients in Pekanbaru City*

Methods: This type of research is quantitative research with a descriptive survey research design, this study was conducted in Pekanbaru City from August to October 2025. The sampling technique used was purposive sampling, This study used the Diabetes Self-Care Activity Summary Questionnaire (SDSCA), For data analysis in this study, the researcher only used univariate tests with the help of SPSS for Windows 13.

Results: *It was found that for the diet component, the majority (60.3%) were good, for the exercise component, the majority (60.3%) were good, for the blood sugar monitoring component, the majority (50.3%) were good, for the medication compliance component, some were good and some were not good, for the foot care component, the majority were also good (56.9%), and for the smoking component, the majority (86.2%) did not smoke*

Conclusion: *This study concludes that the majority of Type 2 Diabetes Mellitus patients in Pekanbaru have good self-care practices*

Introduction

Type 2 diabetes mellitus (T2DM) is a significant public health concern globally, characterized by insulin resistance and chronic hyperglycemia. It is the predominant form of diabetes, accounting for over 90% of all cases. As the prevalence of obesity rises, particularly in low- and middle-income countries (LMICs), the incidence of T2DM is likewise increasing. The International Diabetes Federation (IDF) reports a prevailing T2DM prevalence of approximately 10.5% among adults, which translates to roughly 537 million individuals impacted globally in 2021 (Ferdous & Ferrell, 2024) . Projections indicate that this figure is set to rise to approximately 643 million (11.3%) by 2030 and further to 783 million (12.2%) by 2045 (Banerjee et al., 2024). This trend showcases a relentless increase in

diabetes prevalence, demanding urgent public health interventions to curb its spread.

The prevalence of Type 2 Diabetes Mellitus (T2DM) in Asia continues to escalate, presenting significant public health challenges. As of 2024, it is estimated that over 60% of the global diabetes population resides in Asia, with varying prevalence rates across different countries and regions. Recent studies indicate a substantial rise in the prevalence of T2DM across Asia, with specific examples demonstrating national and regional disparities. In Malaysia, for instance, the prevalence of diabetes was reported at 15.6% in adults, reflecting a concerning trend linked to rising obesity rates and sedentary lifestyles (Chen et al., 2025). Similarly, recent estimates indicate that approximately 23% of adults in Sri Lanka are affected by diagnosed or undiagnosed diabetes (Premadasa et al., 2024).

The prevalence of Type 2 Diabetes Mellitus (T2DM) in Indonesia remains a significant public health concern, characterized by increasing rates attributed to various factors such as urbanization, dietary habits, and lifestyle changes. As of 2024, Indonesia exhibits a concerning prevalence of T2DM, estimated to affect approximately 8.4% of the adult population, translating to about 20 million individuals based on the country's population estimates. This figure represents a significant increase in comparison to previous years and underscores the escalating public health crisis associated with diabetes. Current estimates suggest that the prevalence of T2DM in Pekanbaru is around 8.6% of the adult population. This figure highlights concerns regarding the rising rates of obesity and associated risk factors within the region (Rakhis et al., 2022)(Guedes et al., 2013).

Complications arising from Type 2 Diabetes Mellitus are both diverse and complex, affecting various aspects of health and quality of life. Understanding the interplay between metabolic control, lifestyle factors, and the development of microvascular and macrovascular complications is crucial for effective management strategies. Recent studies indicate that the prevalence of diabetic nephropathy is increasing, with risk factors such as prolonged hyperglycemia, hypertension, and dyslipidemia exacerbating this condition (Liu et al., 2021). Studies show that maintaining proper glycemic control may reduce the risk of developing retinopathy and slow its progression (Wild & Price, 2011). Recent literature suggests that neurological complications from T2DM are often underdiagnosed and can significantly affect the quality of life (Putri & Waluyo, 2019). Studies indicate that controlling blood sugar levels, alongside addressing other cardiovascular risk factors, can significantly reduce the incidence of heart disease in diabetic patients (8). Foot complications often arise from a combination of neuropathy, poor circulation, and infection, necessitating regular foot care and education to prevent serious outcomes (Singh et al., 2013); (Bowling et al., 2015); (Rossboth et al., 2020); (Monteiro-Soares et al., 2012).

Self-care is a critical component in the management of Type 2 Diabetes Mellitus (T2DM). The chronic nature of diabetes necessitates that patients actively engage in managing their disease, focusing on lifestyle modifications, medication adherence, and regular monitoring of health indicators. Self-care behaviors encompass dietary adjustments, increased physical activity, and regular blood glucose monitoring, all of which are essential for managing T2DM (Zimbudzi et al., 2018). For instance, structured educational programs can enhance self-efficacy, allowing better adherence to self-care practices (Ko et al., 2012). By engaging in self-monitoring and maintaining optimal blood glucose levels, patients can minimize the risk of microvascular and macrovascular complications, such as diabetic neuropathy, retinopathy, and cardiovascular disease (Chiwanga & Njelekela, 2015). Programs that promote self-care can help reduce feelings of distress and improve overall quality of life by fostering independence and self-efficacy in managing diabetes (Hayek et al., 2013); (Nosratabadi, 2025).

Furthermore, support from healthcare professionals has been shown to improve glycemic control and encourage proactive health behaviors. Evidence indicates that interventions that integrate community support can lead to better self-management outcomes in patients with T2DM (Strom & Egede, 2012). Studies reveal that adherence to recommended self-care behaviors is often suboptimal due to multiple factors, including lack of access to educational resources, inadequate healthcare infrastructure, and cultural attitudes toward disease management (Mogre et al., 2019). Therefore, the researcher is interested in conducting research on the description of self-care for type 2 diabetes mellitus patients in Pekanbaru City, which will be the basic data in planning the management of care for type 2 diabetes mellitus patients in Pekanbaru City.

Methods

Research design

This type of research is quantitative research with a descriptive survey research design. Quantitative research is a structured form of inquiry that focuses on quantifying data and typically employs statistical analysis to understand phenomena. This research methodology is prevalent in fields such as social sciences, health, education, and market research, where collecting numerical data enables researchers to test hypotheses, establish relationships, and derive conclusions that are generalizable to larger populations (Ghanad, 2023)(Mandalahi et al., 2024). Furthermore, descriptive survey research is a widely recognized methodology within various fields of study, including education, health, and social sciences. It is primarily designed to collect data that describes characteristics, behaviors, opinions, or conditions of a population at a specific point in time. This methodology enables researchers to gather comprehensive information without exerting control over the variables, thus providing a snapshot of existing phenomena (MURATHAN, 2023).

Setting and samples

This study was conducted in Pekanbaru City from August to October 2025. The sampling technique used was purposive sampling, where this technique includes criterion sampling, where participants meet specific criteria relevant to the phenomenon being studied, and maximum variation sampling, which aims to capture diverse perspectives (Young & Casey, 2018).

The inclusion criteria for this study were: 1. Patients were medically diagnosed with type 2 diabetes mellitus (DM), 2. Patients were able to communicate well (verbally and/or non-verbally) to understand the questions and provide accurate data, 3. Patients were willing to participate in the study, usually indicated by signing an informed consent form, 4. Patients did not have any cognitive or mental disorders that could affect data collection. Then the exclusion criteria in this study are: 1. Patients who are experiencing acute DM complications that require hospitalization, 2. Patients with chronic comorbidities or other serious medical conditions (eg, end-stage renal failure, advanced cancer, recent severe stroke) that may hinder participation or significantly affect self-care outcomes, 3. patients who experience severe physical limitations that hinder the implementation of aspects of self-care (eg, amputations that hinder foot care unless the focus of the study is only on other aspects), 4. Female patients who are pregnant, because this condition has different care management. 5. Respondents who do not complete the questionnaire or provide complete data during the research process.

The population in this study were all type 2 diabetes mellitus patients who resided in Pekanbaru City. Determining the appropriate sample size is crucial for achieving meaningful results. quantitative research typically requires larger samples to facilitate statistical analyzes and generalizability (Subedi, 2023).The sample size in this study was 60 type 2 diabetes mellitus patients. The total size of the target population significantly impacts the sample size calculation. Larger populations typically allow for a smaller percentage of the population to be sampled while still maintaining representativeness. Conversely, smaller populations may require a higher proportion of participants to ensure that the sample reflects the population adequately (Githinji, 2018).

Measurement and data collection;

This study used the Diabetes Self-Care Activity Summary Questionnaire (SDSCA), designed to assess multiple dimensions of self-management in diabetes patients. This instrument was first developed by Toobert and Glasgow, and its psychometric properties have been extensively evaluated through studies in various populations. The researcher adopted the SDSCA questionnaire in its entirety and translated it into Indonesian. Numerous studies support the reliability and validity of the SDSCA. Reports show that the questionnaire possesses strong internal consistency, often assessed through Cronbach's alpha, with values typically exceeding the acceptable threshold of 0.70 (Sugiharto et al., 2019)(Çakmak, 2020). Data collection

was conducted once with respondents accompanied by their families. In this study, the researcher was assisted by two assistants, who had previously been briefed on how to use the SDSCA questionnaire.

Data analysis;

For data analysis in this study, the researcher only used univariate tests with the help of SPSS for Windows 13. The data that the researcher took was the level of self-care of type 2 diabetes mellitus patients in Pekanbaru City. According to Alabi and Bukola, descriptive statistics offer valuable information about central tendencies and variability, facilitating informed decision-making regarding subsequent statistical analyzes (Alabi & Bukola, 2023).

Ethical considerations

This research has passed the ethical test conducted by the researcher at PMC Hospital with number 032/RS.PMC/Komisi.Etik/XI/2025. To ensure the research code of ethics, the researcher provided informed consent to respondents before data collection was carried out.

Results

This study conducted a normality test using the Shapiro-Wilk test to determine the cut off point for self-care levels in diabetes mellitus patients. The results of the normality test showed that the researcher used the mean as the cutoff point.

a. Normality Test

NO	Component	*PValue*	Mean/Median	Score
1	Diet	0.279	mean	17.74
2	Exercise	0.004	median	6.00
3	Glucose Monitoring	0.002	median	8.00
4	Medication	0.000	median	2.50
5	Foot Care	0.000	median	14.00
6	Smoking	0.000	median	0.00

b. Level Of Self Care Diabetes Mellitus

Next, the researcher conducted a univariate analysis of the self-care levels of type 2 diabetes mellitus patients, with the following results:

No	Component	Value		Percentage	
		Good	Not Enough	Good	Not Enough
1	Diet	35	23	60,3	39,7
2	Exercise	35	23	60,3	39,7
3	Glucose Monitoring	31	27	53,4	46,6
4	Medication	29	29	50	50
5	Foot Care	33	25	56,9	43,1
6	Smoking	50	8	86,2	13,8

Based on the of the table above, it was found that for the diet component, the majority (60.3%) were good, for the exercise component, the majority (60.3%) were good, for the blood sugar monitoring component, the majority (50.3%) were good, for the medication compliance component, some were good and some were not good, for the foot care component, the majority were also good (56.9%), and for the smoking component, the majority (86.2%) did not smoke.

Discussion

Based on the research results above, it was found that most type 2 diabetes patients are good at carrying out self-care, but the figures obtained are not large, still not the majority (>75%) of type 2 diabetes patients carry out self-care well, even though this self-care is important in preventing complications in type 2 diabetes patients.

Sustained self-management behaviours are linked to improvements in HbA1c, with effect sizes enhanced when programs include ongoing support and are theory-informed (Zhu et al., 2017). The umbrella review of health education for T2DM and ACS indicates post-discharge, nurse-led or multidisciplinary education delivered face-to-face or via remote contact reduces admissions and supports self-management, including culturally tailored and group-based formats. Theory-based self-management interventions repeatedly show HbA1c improvements, reflecting durable engagement with self-care task (Zhao et al., 2016);(Caro-Bautista et al., 2013) .

Sustained self-care engagement is consistently associated with better health-related quality of life and lower diabetes distress, especially when programs address motivation, coping strategies, and social support (Gupta et al., 2024)(Hatzidimitriadou et al., 2025)(Pirbaglou et al., 2018) . Integrating mental health support within diabetes care can further improve mood and distress, contributing to sustained self-management and adherence "Diabetes Care for Emerging Adults: Recommendations for Transition From Pediatric to Adult Diabetes Care Systems" (Shimu, 2025).

Diabetes knowledge, health literacy, and disease perception influence self-care maintenance and adherence. Cross-cultural and regional studies show education and knowledge often correlate with higher self-care, though the strength and domains vary by population and measurement instrument (Sayed, 2022)(Bults et al., 2023)(Totesora et al., 2019)(Kurdi et al., 2024). Diabetes-related stress, depression, and general psychological stress are strongly associated with self-care behaviors and glycemic control, with some studies suggesting that stress mediates or moderates self-care adherence and outcomes. Stress and depression can undermine health maintenance, while interventions that address these factors can improve self-care engagement and, in some cases, glycemic control (McCoy & Theeke, 2019)(Amirudin et al., 2023)(Ritholz et al., 2014)(Hanlon et al., 2021).

Adolescents, older adults, rural populations, migrants, and racial/ethnic minorities exhibit unique patterns of

self-care maintenance, monitoring, and management, often influenced by health literacy, cultural relevance, family involvement, and access to education. This underscores the need for context-specific descriptions and measurements in research and practice (Ausili et al., 2018)(Zajdel et al., 2018)(Pettersson, 2024). Theory-informed maintenance programs with ongoing follow-up tend to yield improvements in HbA1c and self-management behaviors, especially when tailored to individual capabilities and contexts (Dack et al., 2019)(Carlson et al., 2020)(Obilor et al., 2023).

Implication and limitations

The implications of this research are for Health Services, the results of this research can demonstrate the need for nurses and medical personnel at Pekanbaru Community Health Centers (Puskesmas) to provide structured education regularly, not only during sick visits. For Diet and Activity, on this research if self-care in terms of diet and exercise is still low, interventions should focus on local food processing and the provision of independent exercise facilities. For Community Programs, form this research we can establish Self-Help Groups at the neighborhood level to improve patient compliance and self-efficacy. For Prolanis Optimization, this research can reactivate or optimize the Chronic Disease Management Program (Prolanis) to monitor blood sugar and provide regular dietary counseling. For Complication Screening, we can encourage routine foot and eye screenings at the Community Health Center to prevent further complications (retinopathy, diabetic ulcers), And for Practical Implications (Patients) we can increased Independence: Increase patient understanding that blood sugar control is an individual responsibility (diet, physical therapy, medication).

The Limitations of this study are the research design used was a descriptive survey, which only describes the conditions at the time the data were collected. Then this design cannot demonstrate a definitive causal relationship between self-care behavior and long-term blood sugar levels. Furthermore, for data collection method (Self-Report/Questionnaire) the researcher used a questionnaire (Summary of Diabetes Self-Care Activities - SDSCA) can lead to recall bias (patients forget) or social desirability bias (patients answer what they think is correct, rather than what they actually do). Then, the study may not have considered external factors such as level of family support, income level, or accessibility of healthcare services, which significantly influence self-care behavior, and this study did not differentiate between newly diagnosed and long-term patients, even though their levels of self-care understanding and behavior differ.

Conclusion

This study concluded that most Type 2 Diabetes Mellitus patients in Pekanbaru have good self-care practices. However, many patients still have poor self-care practices, characterized by a lack of optimal diet, exercise, and foot care. Self-care for type 2 diabetes mellitus patients is very important for type 2 diabetes patients to adhere to, if not

adhered to, the incidence of complications in type 2 diabetes patients will continue to increase. Efforts that can be made to improve self-care for type 2 diabetes patients include structured education, such as DSME (Diabetes Mellitus, Management, and Health Teaching), which is needed to improve self-care compliance and prevent disease complications.

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Conflict of interest

In this study, the researcher did not find any conflict of interest.

Author contribution

Author contributions to this research include: Author 1 contributed to the conceptualization, methodology, and drafting of the research. Author 2 conducted data analysis and visualization, and conducted a critical review. All authors have read and approved the final manuscript.

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