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The Relationship Between the Economic Status of Parents of Students with Diabetes Mellitus at SMAN 1 Tambang and Their Motivation to Conduct Regular Blood Sugar Check

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Abstract

Non-compliance in controlling blood sugar levels in diabetes mellitus (DM) patients can lead to serious long-term complications. Regular blood sugar level testing is crucial for DM patients. Success in controlling blood sugar levels depends on motivation, self-awareness, and socio-economic factors. This study employs a quantitative approach with a cross-sectional design conducted at SMAN 1 Tambang, Tambang District, Kampar Regency, Riau Province. The study population includes all parents of students at SMAN 1 Tambang, with a sample size of 81 individuals selected through convenience sampling. Data analysis used univariate and bivariate methods with chi-square tests. The study results indicate that 69.1% of respondents have a low economic status, and 59.3% have low motivation. There is a significant relationship between the economic status of parents of students with DM and motivation to conduct regular blood sugar tests (p-value = 0.002). This study is expected to guide schools in implementing primary prevention efforts for DM among students whose parents are affected, thus preventing early complications.

Keywords

health, community, international, well-being, epidemiology, healthcare, policy, prevention, public health, global health

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Introduction

Non-communicable diseases (NCDs) are a major global health concern, with diabetes mellitus (DM) being one of the leading causes of death. DM is a group of metabolic diseases caused by insulin secretion and function disorders, leading to elevated blood glucose levels (Perkeni, 2021). According to the World Health Organization (WHO, 2023), approximately 422 million people worldwide suffer from DM, with 1.5 million deaths annually. This number is projected to rise to 643 million by 2030 (IDF, 2021). DM can cause acute metabolic complications such as hypoglycemia and hyperglycemia and long-term vascular complications, including cardiovascular disease, stroke, dyslipidemia, hypertension, diabetic retinopathy, diabetic neuropathy, and diabetic foot ulcers (Sulastri, 2022).

Individuals with DM must adhere to regular blood sugar monitoring. Perkeni (2016) recommends measuring blood sugar levels before meals, two hours after meals, and before bedtime to detect asymptomatic hypoglycemia and monitor sugar fluctuations.

Routine self-monitoring of blood sugar can help DM patients evaluate their diet, exercise, and medication intake to maintain stable glucose levels (Qatrunnada, 2022). Regular blood sugar tests are crucial for both DM patients and non-patients (Kusumawati, 2023) to facilitate early diagnosis, reverse prediabetes, anticipate rising glucose levels, and prevent complications (Kusumawati, 2023). DM control success depends on motivation, self-awareness, and socio-economic factors (Soegondo, 2018).

Rizana (2020) stated that several challenges hinder DM patients from conducting regular blood sugar tests, including low economic status, which is determined by family income levels. Decreasing income often compels individuals to cut costs, including healthcare expenses, leading to reduced medication purchases (Renaldi et al., 2021). Socio-economic status is typically linked to knowledge and education levels, where higher education corresponds with better health awareness, particularly in DM prevention (Funakoshi, 2017).

Additionally, controlling blood sugar levels or conducting regular blood sugar tests, whether for DM patients or non-DM individuals, requires motivation, which plays a crucial role in achieving goals (Rahmadanti, 2020). Motivation significantly influences patient recovery rates, as prolonged treatment and care can cause fatigue and non-compliance, leading to poor blood sugar control. Therefore, successful DM management relies on patient motivation and self-awareness (Soegondo, 2018). DM patients who consistently follow dietary therapy and maintain controlled blood sugar levels can reduce both short-term and long-term complications.

According to the Kampar District Health Office (2023), type 2 DM ranks among the top ten diseases in Kampar Regency, placing fourth among priority health concerns. In 2023, there were 6,662 recorded type 2 DM cases across 31 community health centers, with Tambang Health Center contributing the highest number (734 cases). Type 2 DM commonly occurs in individuals over 40 years old, which aligns with the age of most parents of high school students. Parental DM increases the risk of diabetes in children by two to six times (Fahrudini, 2020). Given these concerns, this study aims to explore the relationship between the economic status of parents of students at SMAN 1 Tambang and their motivation to conduct regular blood sugar tests.

Methodology

This study uses a quantitative approach with a cross-sectional design conducted from May 27 to June 4, 2024, at SMAN 1 Tambang, Tambang District, Kampar Regency, Riau Province, Indonesia. A total of 81 research subjects were recruited using a convenience sampling technique. The research sample consists of parents of students diagnosed with DM for at least one year who agreed to participate. Data collection was conducted using an electronic questionnaire comprising 10 open and closed-ended questions via Google Forms. Before completing the electronic questionnaire on Google Forms, research subjects first read the research objectives and provided informed consent if they agreed to participate. The questionnaire used has been tested for validity and reliability, with a Cronbach's Alpha value of 0.87, confirming its validity and reliability. The collected data were analyzed using univariate analysis to determine the frequency distribution of respondent characteristics and chi-square analysis to assess the relationship between economic status and motivation to conduct regular blood sugar tests, with a 95% confidence level.

Results

Table 1. Characteristics of Respondents

Characteristics of Respondents	Frequency (n=81)	Percentage (100%)
Age of Parents		
30-40 Years	16	19.8%
41-50 Years	65	80.2%
Education Level		
Junior High School	19	23.5%
Senior High School	48	59.3%
Higher Education	14	17.3%
Occupation		
Housewife	58	71.6%
Entrepreneur/Trader	15	18.5%
Civil Servant/Contract Worker	8	9.9%
Monthly Family Income		
< Rp. 3,000,000	56	69.1%
≥ Rp. 3,000,000	25	30.9%
Number of Children		
1-2 Children	27	33.3%
3-4 Children	54	66.7%
Distance from Home to Health Center		
≤ 300 m	12	14.8%
1-2 km	48	59.3%
3-5 km	21	25.9%
Vehicle Ownership		
Owns a Vehicle	76	93.8%
Does Not Own a Vehicle	5	6.2%
Health Insurance (BPJS) Ownership		
Owns BPJS	62	76.5%
Does Not Own BPJS	19	23.5%
Owns a Blood Sugar Monitoring Device at Home		
Yes	5	6.2%
No	76	93.8%

From the table above, it can be seen that most of the respondents are aged 41-50 years (80.2%), have a senior high school education (59.3%), are primarily housewives (71.6%), and have a monthly family income of less than Rp. 3,000,000 (69.1%). The majority of respondents have 3-4 children (66.7%), live 1-2 km away from the nearest health center (59.3%), own a vehicle (93.8%), have BPJS health insurance (76.5%), but do not own a blood sugar monitoring device at home (93.8%).

Table 2. Distribution of Parents' Economic Status and Motivation for Regular Blood Sugar Monitoring

Variable	Frequency (n=81)	Percentage (100%)
Economic Status		
Low	56	69.1%
High	25	30.9%
Motivation		
Low	48	59.3%
High	33	40.7%

From the table above, it can be seen that among the 81 parents of students with diabetes mellitus, the majority have a low economic status (69.1%) and low motivation for regular blood sugar monitoring (59.3%).

Table 3. Relationship Between Parents' Economic Status and Motivation for Regular Blood Sugar Monitoring

Parents' Economic Status	Low Motivation (n, %)	High Motivation (n, %)	Total	p-value / POR
Low	33 (58.9%)	23 (41.1%)	56 (100%)	0.002 / 3.957
High	15 (60.0%)	10 (40.0%)	25 (100%)	
Total	48 (100%)	33 (100%)	81 (100%)	

From Table 3, it is found that among 56 parents with a low economic status, 23 (41.1%) have high motivation for regular blood sugar monitoring. Conversely, among 25 parents with a high economic status, 15 (60.0%) have low motivation for regular blood sugar monitoring. The statistical analysis using the chi-square test resulted in a p-value of 0.002, which is ≤ 0.05, indicating a significant relationship between parents' economic status and their motivation for regular blood sugar monitoring. The POR (Prevalence Odds Ratio) of 3.957 (CI = 2.366-3.501) indicates that parents with low economic status are 3.9 times more likely to have low motivation for regular blood sugar monitoring.

Discussion

The results of this study indicate that regular blood sugar level checks are crucial, both for individuals with diabetes mellitus (DM) and those without. This is because diabetes screening helps diagnose the disease early, reverse prediabetes to normal conditions,

anticipate rising blood sugar levels, prevent diabetes, and slow the progression of complications (Kusumawati, 2023). Motivation to monitor blood sugar levels serves as a driving force for DM patients to undergo treatment, monitoring, and medication (Aulia, 2018).

According to Perkeni (2021), individuals with DM must adhere to a series of examinations, including blood sugar level monitoring. Blood sugar levels in DM patients are higher than those in the general population. Rizana (2020) stated that several challenges hinder DM patients from regularly monitoring their blood sugar levels, one of which is low economic status, as reflected in household income. A declining income compels individuals to minimize expenses, including healthcare costs. As a result, some choose to reduce medication purchases to cut expenses (Renaldi et al., 2021).

DM patients with low economic status can still control their blood sugar levels and receive treatment using government-issued health insurance cards. On the other hand, those with higher economic status can afford regular health check-ups, either independently at home or in primary and secondary healthcare facilities (Soegondo, 2018). Motivation plays a crucial role in achieving patient recovery. DM patients who consistently follow dietary therapy and maintain controlled blood sugar levels can reduce the risk of both short-term and long-term complications. Self-Monitoring of Blood Glucose (SMBG) is beneficial if DM patients possess sufficient knowledge and income to purchase a glucometer, enabling them to check their blood sugar levels regularly. Routine self-monitoring provides valuable information regarding dietary intake evaluation, physical activity, and medication effectiveness, thereby maintaining blood sugar control (Qatrunnada, 2022).

Individuals with higher incomes are more capable of preventing DM. This is because they can meet their nutritional needs appropriately and conduct independent blood sugar monitoring. Socioeconomic status is often linked to knowledge and education levels, where individuals with higher education tend to be more knowledgeable about health, making them more aware of DM prevention (Funakoshi, 2017). A study by Saydah and Lochner (2019) found that individuals with low incomes in developed countries have twice the risk of mortality and are more susceptible to diseases, particularly DM. Similarly, Funakoshi et al. (2017) reported in their study on socioeconomic status and type 2 diabetes complications among young adults in Japan that individuals with lower socioeconomic status—due to low education, low income, or lack of stable employment—are at higher risk of developing DM.

Motivation plays a significant role in driving individuals to take actions to achieve a goal (Rahmadanti, 2020). Research by Qatrunnada (2022) showed that 84.8% of DM patients had high motivation for routine blood sugar checks, while 15.2% had low motivation. This finding suggests that most DM patients are highly motivated to recover. However, respondents with incomes below the minimum wage had lower motivation for blood sugar monitoring. This indicates that higher income levels correspond to increased awareness of regular blood sugar checks. Low income and lower education levels are also significantly associated with quality of life and complication prevention in DM patients (Baiyewu, 2019).

Despite the careful execution of this study, several limitations should be noted. First, this

research focuses solely on the economic status of parents of students with diabetes and their motivation for regular blood sugar monitoring, which may limit the generalizability of the findings. Additionally, sample collection limitations restrict the study's coverage. Future research is recommended to broaden the study scope by employing diverse methodologies and involving a larger sample to achieve more comprehensive results. Nevertheless, these limitations do not diminish the validity of the findings but rather present opportunities for further research to refine and expand this field of study.

Conclusion

Based on the study results, it can be concluded that there is a significant relationship between the economic status of parents of students at SMAN 1 Tambang and their motivation to undergo regular blood sugar monitoring, with a p-value of 0.002. The majority of respondents, both from low and high economic backgrounds, exhibited low motivation for regular blood sugar checks.

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Author's Contribution

Nanda Sri Rahayu contributed to data collection, and data analysis, and wrote the first draft of the manuscript;

Syafriani contributed to the writing style and supervision of the research.

Author's Biography

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Declaration of Conflicting Interest

No conflict of interest to declare.

Ethical Consideration

The study approval was obtained from Universitas Pahlawan Tuanku Tambusai (Approval number: 123456 on 16 December 2024).

Data Availability Statement

- The dataset produced and examined in the present study can be obtained from the corresponding author upon a reasonable request.
- The supporting data are available at https://dataset.com

Declaration of Use of AI in Academic Writing

Nothing to declare

Reference

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