

The Relationship Between Gratitude and Blood Glucose Levels Among Patients with Diabetes Mellitus

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ABSTRACT

Diabetes mellitus (DM) is a chronic metabolic disease characterized by persistent hyperglycemia resulting from impaired insulin secretion or action. In addition to pharmacological management, non-pharmacological interventions focusing on psychological well-being are increasingly recognized as important components of diabetes care. Gratitude therapy, which emphasizes positive thinking and appreciation of life experiences, has been suggested to improve emotional regulation and physiological outcomes. This study aimed to examine the relationship between gratitude and blood glucose levels among patients with diabetes mellitus. This study employed a quantitative correlational design. A total of 61 patients with elevated blood glucose levels were selected using simple random sampling from a population of 156 patients. Gratitude was measured as the independent variable, while blood glucose level was the dependent variable. Data were analyzed using Spearman's rank correlation test with a significance level of $p < .05$. The results showed that 85.2% of respondents had high levels of gratitude, while 70.5% had normal blood glucose levels. Statistical analysis revealed a strong negative correlation between gratitude and blood glucose levels ($r = 0.649$, $p = .000$), indicating a significant relationship. These findings suggest that higher levels of gratitude are associated with better glycemic control. Gratitude therapy may therefore be recommended as a complementary intervention to support blood glucose management in patients with diabetes mellitus.

Keywords: Blood Glucose Level, Diabetes Mellitus, Gratitude

BACKGROUND

Diabetes mellitus (DM) is one of the most prevalent non-communicable diseases worldwide and poses a serious public health challenge due to its chronic nature and potential complications. DM is characterized by hyperglycemia caused by insufficient insulin production, impaired insulin action, or both, leading to disturbances in carbohydrate, fat, and protein metabolism (Hartanti et al., 2013). Despite patients' awareness of diabetes management strategies, many individuals continue to experience poor glycemic control, which increases the risk of acute and chronic complications.

Data from the Indonesian Basic Health Research (Riskesdas) show a continuous increase in the prevalence of diabetes mellitus, from 6.9% in 2013 to 8.5% in 2018. East Java ranks among the provinces with a high number of diabetes cases, (Kemenkes RI, 2018). Hospital records from indicated that DM was among the leading causes of inpatient morbidity, with 156 recorded cases in 2021.

In addition to pharmacological treatment and lifestyle modification, psychological factors play a crucial role in diabetes management. Psychological stress, anxiety, and depression have been shown to negatively affect glycemic control through neuroendocrine mechanisms, including increased cortisol and catecholamine secretion (Soethama et al., 2020). Conversely, positive psychological states may contribute to improved metabolic outcomes.

Gratitude is defined as a moral and emotional response that arises when individuals recognize and appreciate positive outcomes or benefits received from others or life circumstances (McCullough et al., 2001). Emmons conceptualized gratitude as a positive emotional state that enhances psychological well-being and promotes adaptive coping strategies (Putra, 2014). Previous studies have demonstrated that gratitude is positively associated with psychological well-being and quality of life among patients with chronic illnesses, including diabetes mellitus (Akbar & Astuti, 2018). Gratitude may influence blood glucose levels indirectly by improving emotional regulation, reducing stress, and enhancing adherence to treatment regimens. Positive emotions are associated with increased dopamine release, which contributes to feelings of well-being and may reduce stress-induced hyperglycemia. Therefore, this study aimed to analyze the relationship between gratitude and blood glucose levels among patients with diabetes mellitus.

METHODS

This study employed a quantitative correlational research design aimed at examining the relationship between levels of gratitude and blood glucose control among patients with diabetes mellitus. The correlational approach was selected because the study did not involve manipulation of variables but sought to identify the direction and strength of the association between psychological and physiological variables within a natural clinical setting.

The study was conducted in a healthcare setting where patients diagnosed with diabetes mellitus routinely received medical care and blood glucose monitoring. The study population consisted of 156 patients who had been clinically diagnosed with diabetes mellitus and met the inclusion criteria established by the researchers. From this population, a sample of 61 participants was selected using simple random sampling, ensuring that each eligible patient had an equal opportunity to be included and thereby minimizing selection bias.

The independent variable in this study was gratitude, which was measured using a standardized and validated gratitude questionnaire designed to assess individuals' tendencies to recognize and appreciate positive aspects of their lives. The instrument demonstrated acceptable levels of reliability and validity based on prior psychometric testing. Participants completed the questionnaire under standardized conditions to ensure consistency in data collection.

The dependent variable was blood glucose level, which was measured through routine blood glucose testing conducted by healthcare professionals using calibrated medical equipment. Blood glucose measurements were obtained in accordance with standard clinical procedures to ensure accuracy and reliability of the physiological data.

Data analysis was carried out using Spearman's rank correlation coefficient, as the data did not meet the assumptions of normal distribution. This non-parametric statistical test was used to determine the strength and direction of the correlation between gratitude scores and blood glucose levels. Statistical significance was established at a p-value of less than 0.05 ($p < .05$), indicating that the observed relationship was unlikely to have occurred by chance.

RESULTS

The results showed that the majority of respondents (85.2%) had a high level of gratitude, while 70.5% of respondents had blood glucose levels within the normal range. Spearman's rank

correlation analysis revealed a strong correlation between gratitude and blood glucose levels ($r = 0.649$) with a significance value of $p = .000$. Since the p -value was less than $.05$, the null hypothesis was rejected, indicating a significant relationship between gratitude and blood glucose levels among patients with diabetes mellitus.

The results of the study regarding respondents' levels of gratitude, blood glucose status, and the relationship between these variables are summarized in Table 1. This table presents the distribution of gratitude levels, blood glucose categories, and the findings of the Spearman's rank correlation analysis conducted among patients with diabetes mellitus.

Table 1. Distribution of Gratitude Levels, Blood Glucose Levels, and Correlation Analysis

Variable	Category / Statistic	Frequency (n)	Percentage (%)
Gratitude Level	High	—	85.2
	Moderate–Low	—	14.8
Blood Glucose Level	Normal Range	—	70.5
	Above Normal Range	—	29.5
Correlation Analysis	Spearman's r	0.649	—
	p -value	.000	—

Note: Statistical significance was set at $p < .05$.

As shown in Table 1, the majority of respondents demonstrated a high level of gratitude (85.2%), and most participants had blood glucose levels within the normal range (70.5%). The Spearman's rank correlation analysis revealed a strong positive correlation between gratitude and blood glucose levels ($r = 0.649$). The significance value ($p = .000$) was lower than the predetermined alpha level of $.05$, leading to the rejection of the null hypothesis. These findings indicate that there is a statistically significant relationship between gratitude and blood glucose levels among patients with diabetes mellitus, suggesting that higher levels of gratitude are associated with better blood glucose control.

DISCUSSION

The findings of this study indicate that higher levels of gratitude are significantly associated with better blood glucose control among patients with diabetes mellitus. This result is consistent with previous research suggesting that gratitude is positively associated with psychological well-being and adaptive coping in individuals with chronic diseases (Akbar & Astuti, 2018; Rahmanita et al., 2016).

Gratitude may contribute to improved glycemic control by reducing psychological stress, which is known to increase blood glucose levels through hormonal pathways. Patients who practice gratitude tend to experience more positive emotions, stronger social support, and higher levels of spiritual engagement, all of which may enhance treatment adherence and healthy lifestyle behaviors. These findings support the biopsychosocial approach to diabetes management, emphasizing the integration of psychological interventions alongside medical treatment.

CONCLUSION

This study concludes that there is a strong and significant relationship between gratitude and blood glucose levels among patients with diabetes mellitus. Patients with higher levels of gratitude tend to have better blood glucose control. Gratitude therapy may therefore be recommended as a complementary non-pharmacological intervention to support diabetes management.

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