Resilience and Self-Efficacy as Predictors of Anxiety: The Mediating Role of Growth Mindset in Diabetes Mellitus Patients

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ABSTRACT: Patients with diabetes mellitus frequently experience anxiety that negatively affects their quality of life and treatment adherence. Psychological resources such as resilience and self-efficacy are known to play protective roles, yet the psychological mechanisms explaining their influence on anxiety remain not fully understood. This study examined the mediating role of growth mindset in the relationship between resilience, self-efficacy, and anxiety among patients with diabetes mellitus. A cross-sectional correlational quantitative design using Structural Equation Modeling involved 160 patients with diabetes mellitus at hospitals in Kediri, selected through cluster sampling. Instruments included the resilience scale, self-efficacy scale, Growth Mindset Scale, and anxiety scale. Data analysis was conducted using SmartPLS 4.0. Resilience showed a significant negative effect on anxiety, while self-efficacy demonstrated a non-significant negative effect. Resilience and self-efficacy exhibited significant positive effects on growth mindset, and growth mindset demonstrated the strongest negative effect on anxiety. Growth mindset partially mediated the role of resilience on anxiety and fully mediated the role of self-efficacy on anxiety. Growth mindset functions as an active psychological mechanism in reducing anxiety related to disease burden. These findings provide an empirical basis for developing growth mindset-based psychoeducational interventions to strengthen self-efficacy and psychological resilience, thereby reducing anxiety, and improving treatment adherence among patients with diabetes mellitus.

INTRODUCTION

Diabetes Mellitus (DM), commonly known as diabetes, is characterized by poorly controlled blood glucose levels resulting from inadequate insulin production or the body's failure to effectively utilize insulin when produced (Hossain et al., 2024). DM is classified into four groups based on aetiology: type 1 DM, type 2 DM, gestational DM, and other types of DM associated with medication use or other diseases (Safera et al., 2023). However, the most common types are type 1 and type 2, both of which have recognized diagnostic criteria (Lancet, 2023). Data from 2021 indicate that 537 million adults, approximately 10.5% of the global population, are living with diabetes mellitus, with projections estimating an increase to 643 million by 2030 (Magliano & Boyko, 2021). In the Southeast Asian region, including Indonesia, DM has been a serious health problem since the 1980s (Waspadji et al., 1983). A study projecting diabetes prevalence and mortality in Indonesia from 2017 to 2024 shows an increase from 8.13% to 9.49% (Wahidin et al.,

2024), while in East Java, the rate rose from 2.1% to 2.6% (Abidin et al., 2025). Data from the East Java Provincial Health Office in 2023 recorded 859,187 cases of diabetes mellitus, exceeding the estimated number of 854,454 patients, or approximately 100.6% of the projection (Dinkes Jatim, 2024). The number of diabetes patients continues to increase annually, according to statistics from Kediri City and diagnosed diabetes cases in the population. In 2017, 6,464 people were known to have diabetes, and by the latest data in 2022, DM patients in Kediri City reached 10,470 patients (Farida & Al Zhazura, 2024).

One psychological problem frequently experienced by patients with diabetes mellitus is anxiety resulting from their chronic condition. Based on a study by Kumar et al. (2021), the proportion of diabetic patients experiencing anxiety was 33%, higher than individuals experiencing depression (27.8%). Global-scale research also indicates that the prevalence of psychological disorders, including anxiety, among diabetic patients reaches 28% (Mersha et al., 2022). In Indonesia, a study by Elnaem et al. (2025) involving 606 diabetic patients found that 41.6% were at risk of experiencing anxiety related to their chronic condition.

Research conducted by Wulandari and Widayati (2020) confirms that anxiety responses in individuals can manifest in various distinctive forms, such as feelings of restlessness, excessive vigilance, and persistent uneasiness. This condition reflects internal tension that is difficult to control and is often accompanied by disproportionate worry about the situation at hand. Meanwhile, Abbas (2023) adds that anxiety frequently emerges as an emotional reaction to significant lifestyle changes, such as dietary adjustments, physical activity modifications, or medication routines. Additionally, anxiety can be triggered by persistent worries about the possibility of disease complications, which reinforces feelings of insecurity and uncertainty within the individual. Overall, anxiety appears as a complex psychological condition that accompanies many aspects of life, especially when individuals face situations that threaten their physical or emotional balance.

Based on interviews with several type 2 diabetes mellitus patients, the emotional reactions individuals experience due to this chronic disease are quite diverse. All three patients revealed that they are often overwhelmed by repetitive negative thoughts, such as excessive worry about potential complications and uncertainty in managing their health condition. The patients also admitted to frequently feeling anxious, fearing their inability to control blood sugar levels, experiencing continuous emotional tension, and even feeling hopeless in undergoing treatment. Furthermore, all three patients tend to avoid strenuous physical activities due to fear that their health condition might worsen. In some cases, decreased treatment adherence was also observed. Interestingly, all patients stated that when they felt very anxious or preoccupied with many thoughts, their blood sugar levels tended to increase. This finding aligns with research results by Angriani and Baharuddin (2020), which demonstrate a significant relationship between anxiety levels and blood sugar levels in type 2 diabetes mellitus patients.

Anxiety experienced by patients with chronic diseases such as diabetes mellitus has a significant impact on daily life. Although anxious reactions can be adaptive in facing threats, for some people, the inability to manage anxiety can impair functioning and quality of life (Mertens et al., 2020). Furthermore, research by Zeng Zihuan et al. (2023) shows that anxiety affects various aspects of patients' lives, ranging from physical health and psychological conditions to social functioning. This anxiety often triggers negative psychological reactions, such as feelings of worthlessness, anger, and depression, which ultimately decrease self-confidence, foster pessimistic attitudes toward the future, and even generate feelings of hopelessness (Irawandi, 2020; Maulasari, 2020; Putra et al., 2024). A study by Inagaki et al. (2022) also found that diabetic patients tend to experience diabetes stigma and negative emotions that can disrupt patients' quality of life, especially when patients must accept the reality that this disease is incurable. Under such conditions, many patients struggle to enjoy life because they are required to continuously

manage the disease (Millenia Supriatna & Avianti, 2022). Moreover, anxiety resulting from drastic lifestyle changes can reduce treatment adherence (Abbas, 2023), and if left untreated, anxiety can trigger stress hormone activation that impacts glucose metabolism disorders and worsens glycaemic control (Kheirkhah et al. 2023). The accumulation of these impacts not only exacerbates psychological conditions but also increases the risk of serious physiological complications such as cardiovascular disease, cerebrovascular disease, diabetic nephropathy, and diabetic retinopathy (Nada et al., 2024).

Previous research indicates that anxiety can be reduced if diabetic patients possess high levels of resilience (Surjoseto & Sofyanty, 2023; Skedgell et al., 2021; Wojujutari et al., 2024). Resilience refers to an individual's ability to bounce back from adversity. Connor and Davidson (2003) define resilience as a personal quality that enables someone to persevere and thrive despite facing life's challenges. Resilient individuals possess dimensions such as personal competence, high standards, and tenacity; trust in one's instincts, tolerance for negative emotions, and strengthening effects of stress; positive acceptance of change and secure relationships; control and agency; and spiritual influences (Connor & Davidson, 2003). Besides resilience, self-efficacy is also an important psychological factor that can influence anxiety levels (Delshad et al., 2022; Mousset et al., 2024; Anicama et al., 2025).

The emphasis on self-efficacy reflects an individual's optimistic belief in their ability to face challenges, perform difficult or new tasks, and adapt to various life situations (Schwarzer & Jerusalem, 1995; Nadyastuti et al., 2021). Self-efficacy refers to a person's confidence in managing their disease (Farmer et al., 2021). A quasi-experimental study on women with gestational diabetes found that group training to enhance self-care significantly increased self-efficacy and reduced patient anxiety levels after a four-week intervention (Kheirkhah et al., 2023). Other research confirms that diabetic patients with high self-efficacy have better abilities in managing stress and self-care, which contribute to better blood sugar control and reduced anxiety symptoms (Li & Guo, 2024).

Rationale of the Study

Resilience and self-efficacy are two psychological resources that play important roles in reducing anxiety risk and enhancing individuals' ability to face life pressures adaptively. Research by Ma et al. (2021) how that both resources contribute significantly to anxiety levels. Consistent with these findings, Tsibidaki (2021) affirms that self-efficacy, which reflects an individual's belief in their own abilities, and resilience, which refers to the ability to recover from pressure and difficulties, together can meaningfully reduce anxiety symptoms. Therefore, the selection of resilience and self-efficacy as variables in this study is based on strong empirical evidence regarding their contribution to maintaining mental health and effectively managing anxiety.

However, resilience and self-efficacy alone are not always sufficient to reduce anxiety; a mediator is needed to explain the psychological mechanisms underlying this relationship. Many studies still only examine the direct relationship between resilience, self-efficacy, and anxiety without exploring mediating factors. One factor that potentially serves as a mediator and provides a more in-depth approach to understanding this relationship is growth mindset, which is the belief that abilities can develop through effort and experience (Lo et al., 2023). Growth mindset represents a person's beliefs about human attributes (Han & Stieha, 2020). Individual beliefs are fundamental to understanding human behavior, whether traits and behaviors are fixed or changeable. Several characteristics possessed by people with a growth mindset include accepting challenges and striving hard to face them, and viewing failure as a learning opportunity (Pratiwi et al., 2020). According to a study by Wolcott et al. (2021), individuals with a growth mindset tend to be more resilient and confident in managing their health, thus better able to cope with emerging anxiety.

Resilience and self-efficacy play important roles in shaping a growth mindset, which in turn can mediate their relationship with individual anxiety levels. Various studies show that self-efficacy, particularly that derived from mastery experience and verbal persuasion, can form and strengthen a person's mindset into a growth mindset (Wangwongwiroj & Yasri, 2021). In this context, experiences of overcoming life difficulties and confidence in personal competence form the cognitive and emotional foundation that encourages the emergence of a growth mindset. On another note, growth mindset not only acts as a psychological protective mechanism but also becomes a mechanism that strengthens the positive impact of resilience and self-efficacy in reducing anxiety (Aquaimba et al., 2024).Growth mindset is effective in helping reduce the negative impact of anxiety not only by decreasing its intensity but also by strengthening individuals' ability to cope with it adaptively (Hoyt et al., 2023). On the other hand, theoretical and empirical approaches regarding the mediating role of growth mindset in the relationship between resilience, self-efficacy, and anxiety remain limited, especially in the context of diabetic patients. Much existing research is still correlational and conducted on general populations, without specifically testing this mediation model, particularly among diabetes mellitus patients (Zhang et al., 2020; Rayani et al., 2022; Lo et al., 2023). Resilience and self-efficacy have been proven to simultaneously contribute to reducing anxiety symptoms (Kuang et al. 2021a; Ting et al. 2025a). However, on the other hand, individuals with self-efficacy are not always guaranteed to be free from anxiety, especially when facing intense psychological pressure or influenced by other external factors (Trisnaningati, 2021). Additionally, a study by Calo et al. (2024) also shows that individuals with a growth mindset do not automatically have low anxiety levels (Hoyt et al., 2023).

This study empirically examines the role of growth mindset as a mediator in the relationship between resilience, self-efficacy, and anxiety in patients diagnosed with diabetes mellitus. The primary focus of this research is to explore the direct and indirect relationships among the three main variables through the mediation mechanism bridged by growth mindset. In this regard, resilience and self-efficacy are viewed as psychological protective mechanisms that play roles in reducing anxiety, while growth mindset is assumed to be a mediating variable that bridges their influence on patient anxiety.

Study Aim and Hypothesis

This study aims to examine the role of growth mindset as a psychological mechanism that explains how resilience and self-efficacy can contribute to reducing anxiety levels. The hypotheses of this study are: (a) resilience and self-efficacy have a significant effect on anxiety; (b) resilience and self-efficacy have a significant effect on growth mindset; (c) growth mindset has a significant effect on anxiety; (d) growth mindset mediates the role of resilience on anxiety; (e) Growth mindset mediates the role of self-efficacy on anxiety in patients with diabetes mellitus.

METHODS

Design

This study employed a quantitative approach with a correlational design. This design was chosen to examine the direct and indirect relationships among resilience, self-efficacy, and anxiety with growth mindset as a mediator in diabetes mellitus patients. The following is the research framework.

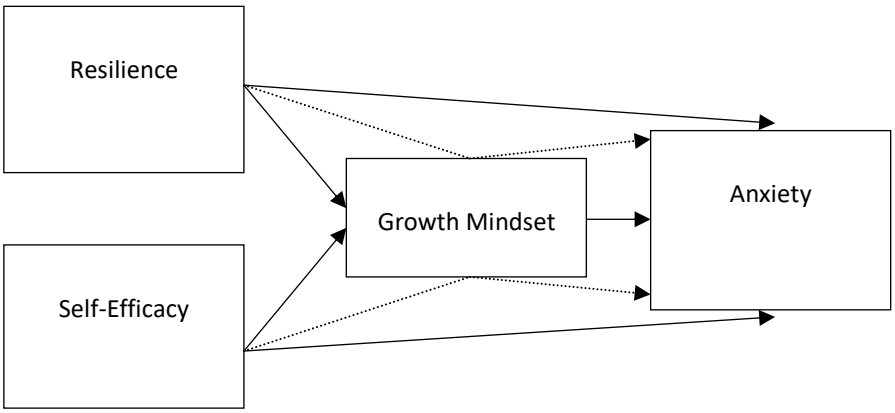

Figure 1. The Research Framework

Participants

The population consisted of diabetes mellitus patients in Kediri City and Regency. Inclusion criteria: (1) patients diagnosed with type 1 or type 2 DM; (2) aged 20-65 years; (3) receiving treatment at the research locations and able to communicate well. Exclusion criteria: (1) history of severe psychiatric disorders; (2) acute medical crisis condition; and (3) failure to complete the entire instrument. Sample size was calculated using the rule of thumb formula, totalling 160 patients. The following is a summary of the research sample in the table below.

Table 1. Number of Participants

No	Hospital Name	Average Patients per Month	Proportion Formula	Hospital Sample
1	Bhayangkara Hospital	256	(256/500) × 160	82
2	Gambiran Regional General Hospital	125	(125/500) × 160	40
3	Simpang Lima Gumul Regional General Hospital	119	(119/500) × 160	38
	Total	500		160

Instruments

Data collection techniques are carried out using some instrument. The anxiety variable was measured using an adapted State-Trait Anxiety Inventory (STAI-T5) instrument, specifically the trait anxiety component consisting of 5 items, with response options using a 4-point Likert scale: 1 = Not at all, 2 = Somewhat, 3 = Moderately so, and 4 = Very much so. The cut-off score on STAI-T5 of ≥14 indicates potential anxiety as a general clinical tendency. Score interpretation indicates possible anxiety if trait anxiety score > 13.5 (Zsido et al. 2020). STAI-5 has acceptable reliability with a Cronbach's Alpha value of 0.777 (95% CI: 0.612–0.880) and good validity as all items significantly correlated with the total score ($r = 0.696–0.793$; $p < 0.001$).

The resilience variable was measured using the Connor-Davidson Resilience Scale (CD-RISC-10), developed based on the original scale by Connor and Davidson (2003), through an item reduction process by Campbell-Sills and Stein (2007), and in this study, reliability and validity testing was conducted on the research sample. This scale consists of 10 statements with responses using a 5-point Likert scale: 0 = Not true at all, 1 = Rarely true, 2 = Sometimes true, 3 = Often true, and 4 = True nearly all the time. CD-RISC-10 has good reliability with a Cronbach's Alpha value of 0.891 (95% CI: 0.819–0.939) and good validity as all items significantly correlated with the total score ($r = 0.403–0.851$; $p < 0.001$).

The self-efficacy variable was measured using an adapted Generalized Self-Efficacy Scale (GSE) consisting of 10 items. This scale uses a 4-point Likert rating format: 1 = Not at all true, 2 = Hardly true, 3 = Moderately true, and 4 = Exactly true. It measures only one dimension (unidimensional): goal setting, effort investment, persistence in the face of barriers, and recovery from setbacks (Schwarzer & Jerusalem, 1995). The Generalized Self-Efficacy Scale has good reliability with a Cronbach's Alpha value of 0.816 (95% CI: 0.688–0.899) and good validity as all items significantly correlated with the total score ($r = 0.410–0.762$; $p < 0.001$).

The growth mindset variable was measured using an adapted Growth Mindset Scale (GMS) developed by Hermundur Sigmundsson and Monika Haga (2024) berd based on Carol Dweck's (1999) growth mindset theory. This scale consists of 8 items using a 5-point Likert rating format, from 1: Not like me at all, 2: Slightly like me, 3: Moderately like me, 4: Mostly like me, and 5: Very much like me. The Growth Mindset Scale has excellent reliability with a Cronbach's Alpha value of 0.914 (95% CI: 0.850–0.954) and good validity as all items significantly correlated with the total score ($r = 0.646–0.878$; $p < 0.001$).

Data Collection

Data collection began by requesting research permission from hospital management and coordinating with head nurses at each research location. Researchers identified diabetes mellitus patients through patient lists and medical records, then conducted screening based on inclusion and exclusion criteria with confirmation from attending physicians or nurses. Patients meeting the criteria were approached by researchers and given complete explanations regarding research objectives, benefits, questionnaire completion procedures, estimated time (20-30 minutes), data confidentiality guarantees, voluntary participation, and the right to withdraw without consequences. After patients agreed and signed informed consent, researchers provided questionnaires with explanations on how to complete them and emphasized the importance of answering all items honestly.

Questionnaire completion was conducted with researcher supervision to ensure respondents understood each item, provide clarification if needed without influencing answers, and assist respondents with visual limitations by reading items aloud. After questionnaires were completed, researchers verified data completeness, checked response patterns to detect inconsistencies, and requested respondents to complete any missed items. Complete questionnaires were assigned unique identity codes to maintain confidentiality and stored in a secure location.

Data Analysis

Descriptive analysis described respondent characteristics. Inferential analysis employed PLS-SEM using SmartPLS. Outer model evaluation: convergent validity (loading factor ≥0.50), discriminant validity (HTMT <0.85), reliability ($\alpha>0.60$, CR>0.70). Inner model evaluation: R^2 and Q^2. Hypothesis testing was significant if T-statistics ≥1.97 or $p<0.05$.

RESULTS AND DISCUSSION

Result

Descriptive Analysis

The following presents the frequency distribution of demographic characteristics of diabetes mellitus patients who served as respondents in this study. This description provides a general overview of the overall participant profile.

Table 2. Demographic Characteristics of Diabetes Mellitus Patients

Variable	Category	Frequency	Percentage
Type of Diabetes Mellitus	Type1	6	3.8
	Type 2	154	96.3
Developmental Stage	Early Adulthood	4	2.5
	Middle Adulthood	106	66.3
	Late Adulthood	50	31.3
Education	Did Not Complete Elementary School	13	8.1
	Elementary School	51	31.9
	Junior High School	27	16.9
	Senior High School	46	28.7
	Diploma (D3/D4)	3	1.9
	Bachelor's Degree (S1)	19	11.9
	Master's Degree (S2)	1	.6

Based on the data distribution results from Table 1, the majority of respondents were individuals with Type 2 Diabetes Mellitus who were generally in the middle adulthood developmental stage. The dominance of type 2 DM in this age group reflects the increasing burden of chronic disease with advancing age, making the accompanying physiological and psychological challenges, including anxiety, increasingly significant. Additionally, the majority of respondents had educational levels at the elementary school level, making them more vulnerable to experiencing barriers in obtaining, understanding, and utilizing health information or facilities.

Univariate Analysis

The following presents the univariate analysis results for all variables in this study. This analysis aims to provide an initial overview of data distribution, including frequency, percentage, and basic values that describe the characteristics of each variable before conducting further analysis.

Table 3. Frequency Distribution of Each Variable

Categorization	Frequency	Percentage
Resilience		
Low	24	15.0
Moderate	100	62.5
High	36	22.5
Total	160	100.0
Self-Efficacy		
Low	25	15.6
Moderate	106	66.3
High	29	18.1
Total	160	100.0
Growth Mindset		
Low	21	13.1
Moderate	98	61.3
High	41	25.6
Total	160	100.0
Anxiety		
Not Anxious	62	38.8
Anxious	98	61.3
Total	160	100.0

The results from Table 2 indicate that most diabetes mellitus patients have moderate levels of psychological resilience, self-efficacy, and growth mindset in facing their disease condition.

Interestingly, the proportion of respondents with high resilience (22.5%) is greater than those with low resilience (15.0%), similarly, those with high growth mindset (25.6%) outnumber those with low levels (13.1%), indicating reasonably good psychological adaptation potential in this population. However, anxiety data show that more than half of the respondents (61.3%) experience anxiety.

Outer Model Evaluation

Outer model evaluation is the stage of evaluating construct validity and reliability, namely construct validity evaluation and construct reliability evaluation, which will be explained in the following figures.

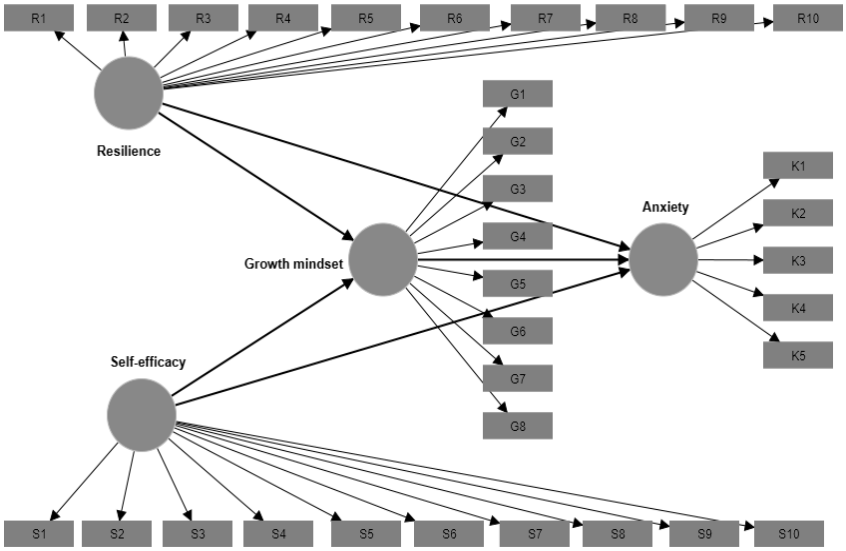

Figure 2. Initial Outer Model Construct

Construct validity evaluation uses convergent validity calculations through loading factor values, which should have loading factors above 0.5 (Chin, 1998). The convergent validity test results are presented in the figure below.

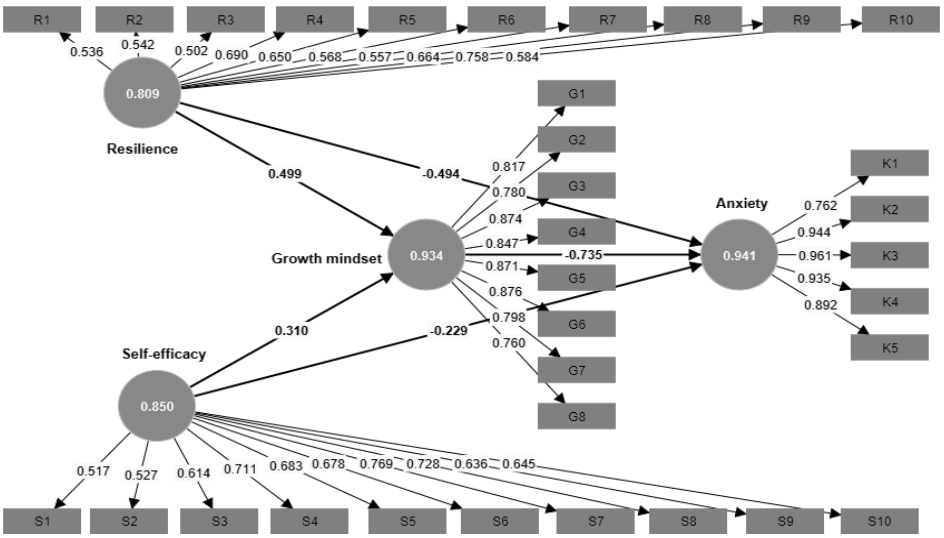

Figure 3. Loading Factor Outer Model Construct

Based on Figure 3, all items have loading factors above 0.5. All items from the resilience, self-efficacy, growth mindset, and anxiety variables are considered significant in measuring those variables, so no reduction was performed on these indicators. Thus, the conclusion from the convergent validity test is that all indicators are valid in measuring their respective variables.

Discriminant validity describes the extent to which a construct differs from other constructs statistically (Hair et al., 2019). Testing is conducted using the HTMT (Heterotrait-Monotrait Ratio) criteria below 0.85 or 0.90 (Henseler et al., 2015). Cross-loading calculations are displayed in the table 3.

Table 3. Discriminant Validity Results

	Self-Efficacy	Growth Mindset	Anxiety	Resilience
Self-Efficacy				
Growth Mindset	0.753			
Anxiety	0.665	0.882		
Resilience	0.888	0.831	0.792	

The Heterotrait-Monotrait Ratio (HTMT) measurement results based on Table 3 show that all construct pairs have values below the 0.90 threshold as recommended by Henseler, Ringle, and Sarstedt (2015). HTMT values for construct pairs of Growth Mindset with Self-Efficacy are 0.753, Anxiety with Self-Efficacy is 0.665, Anxiety with Growth Mindset is 0.882, Resilience with Self-Efficacy is 0.888, Resilience with Growth Mindset is 0.831, and Resilience with Anxiety is 0.762. All these values are below the maximum criterion of 0.90, thus it can be concluded that each construct in the model has adequate discriminant validity and is capable of distinguishing itself from other constructs empirically.

In measuring construct reliability, composite reliability values are used. If composite reliability has a value greater than 0.7, it can be considered reliable (Musa et al., 2024). Composite reliability calculations are presented in the table below:

Table 4. Construct Reliability Results

	Cronbach's alpha	Composite Reliability (rho_a)	Composite Reliability (rho_a)
Self-Efficacy	0.850	0.855	0.881
Growth Mindset	0.934	0.937	0.946
Anxiety	0.941	0.946	0.956
Resilience	0.809	0.816	0.854

Based on the results from Table 4, it can be seen that each variable has a composite reliability value above 0.7, so all items are declared reliable in measuring their respective variables.

Structural Model Evaluation

Coefficient of Determination (R2)

The coefficient of determination or R Square (R^2) is used to determine how much the endogenous variable (dependent variable) explains the contribution of exogenous variables to the endogenous variable (Yamin, 2021). Interpretation values are established with categories of 0.02 as a small effect, 0.15 as a moderate effect, and 0.35 as a large effect (Henseler et al., 2009; Hair et al., 2019). The R^2 results are presented in the table below:

Table 5. R^2 Coefficient of Determination Results

	R-square	R-square adjusted
Growth Mindset	0.574	0.569
Anxiety	0.694	0.688

The results in Table 5 show the R-square for Growth Mindset (M) is 0.574 or 57.4%. This indicates that 57.4% of the variation in growth mindset can be explained by the independent variables resilience (X1) and self-efficacy (X2). The remaining 42.6% is the contribution of other

variables not explained in this study. This value is considered substantial (Henseler et al., 2009; Hair et al., 2019) classify R^2: 0.02 = small (weak), 0.15 = moderate, and 0.35 = large (substantial). The results in Table 5 show the R-square for anxiety (Y) is 0.694 or 69.4%. This indicates that 69.4% of the variation in anxiety can be explained by resilience (X1), self-efficacy (X2), and growth mindset (M). The remaining 30.6% is the contribution of other variables not explained in this study. This value is considered substantial as it is above 0.35.

Table 6. F-Square (f^2) Results

	Growth Mindset	Anxiety
Resilience	0.265	0.019
Self-Efficacy	0.102	0.000
Growth Mindset		0.750

Based on the f-square analysis results, growth mindset shows a very large effect size on anxiety (f^2 = 0.750), indicating that growth mindset is a very strong predictor in explaining variation in anxiety levels. Meanwhile, both self-efficacy and resilience have more substantial effect sizes on growth mindset with f^2 values of 0.102 (small effect) and 0.265 (moderate effect), compared to their direct influence on anxiety, which is very minimal with f^2 values of 0.000 and 0.019.

Inter-variable testing uses the criteria of T-statistics ≥ 1.97 or P-value < 0.05 to determine the significance of the influence of exogenous variables on endogenous variables (Yamin, 2021). Effect magnitude classification refers to Cohen's (Cohen, 1988), guidelines, where coefficient β of 0.10–0.29 indicates a small effect, 0.30–0.49 a moderate effect, and ≥ 0.50 a large effect (Nieminen, 2022). The test results are presented in the figure below.

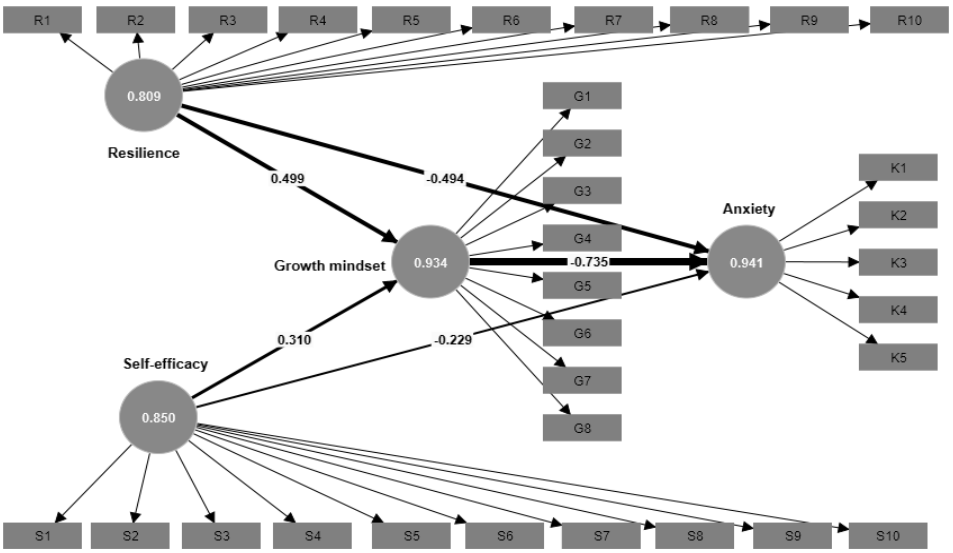

Figure 4. Inner Model Construct Through Growth Mindset

Table 7. Mediation Hypothesis Test Results

	Original sample (0)	Sample mean (M)	Standard deviation (STDEV)	T statistic (|O/STDEV|)	P Values
Resilience → Growth Mindset → Anxiety	-0.367	-0.379	0.101	3.641	0.000
Self-Efficacy → Growth Mindset → Anxiety	-0.228	-0.230	0.095	2.386	0.017

Table 8. Hypothesis Test Results

	Original sample (0)	Sample mean (M)	Standard deviation (STDEV)	T statistic (|O/STDEV|)	P Values
Resilience → Anxiety	-0.494	-0.496	0.109	4.540	0.000
Self-Efficacy → Anxiety	-0.229	-0.223	0.117	1.959	0.050
Resilience → Growth Mindset	0.499	0.508	0.111	4.483	0.000
Self-Efficacy → Growth Mindset	0.310	0.307	0.115	2.685	0.007
Growth Mindset → Anxiety	-0.735	-0.744	0.097	7.559	0.000

Direct Effects on Anxiety, Analysis results show that resilience has a significant negative effect on anxiety (β = -0.494; T = 4.540; p < 0.001), indicating that increased resilience contributes to reduced anxiety levels in diabetes mellitus patients. Conversely, self-efficacy does not show a significant effect on anxiety (β = -0.229; T = 1.959; p = 0.050), although the coefficient direction is negative.

Effects on Growth Mindset. Both predictor variables show significant positive effects on growth mindset. Resilience contributes substantially (β = 0.499; T = 4.483; p < 0.001), as does self-efficacy (β = 0.310; T = 2.685; p = 0.007), confirming that both psychological constructs play a role in forming a growth mindset.

Role of Growth Mindset and Mediation Effects. Growth mindset is proven to have a significant negative effect on anxiety with the largest effect magnitude (β = -0.735; T = 7.559; p < 0.001), demonstrating its role as a strong protective factor (growth mindset on anxiety, accepted). Furthermore, mediation analysis reveals that growth mindset significantly mediates the effect of resilience on anxiety (β = -0.367; T = 3.641; p < 0.001) as well as the effect of self-efficacy on anxiety (β = -0.228; T = 2.386; p = 0.017), confirming a partial mediation role (growth mindset mediates resilience on anxiety, and growth mindset mediates self-efficacy on anxiety, accepted). These findings indicate that growth mindset functions as a simultaneous mediation mechanism in the relationship between resilience and self-efficacy with anxiety.

Discussion

The Role of Resilience and Self-Efficacy on Anxiety Levels in Diabetes Mellitus Patients

Resilience plays a significant role in reducing anxiety in diabetes mellitus patients with a large effect size (Cohen, 1988). Based on Social Cognitive Theory (Bandura 1986), resilience represents a behavioral factor that regulates adaptive responses through coping mechanisms, emotion regulation, and self-regulatory capability (Bandura, 2006). Resilient individuals are capable of self-control and adaptation to challenging medical situations. This finding aligns with Daffer et al. (2024), who found that diabetic patients with high resilience have better glycemic control and lower anxiety. Skedgell et al. (2021) identified that diabetes-specific resilience, including problem-solving strategies and adaptive emotion regulation, plays a significant role in reducing psychological distress. Wojujutari et al. (2024) reported that resilience mediates the relationship between diabetes distress and symptoms of depression and anxiety. A longitudinal study by Shilton et al. (2023) showed that initial resilience predicts lower anxiety trajectories during crises. Surjoseto and Sofyanty (2023) found that increased resilience facilitates positive adaptation to chronic illness, while Torrelles Nadal et al. (2025) confirmed that resilience consistently protects against anxiety while enhancing psychological well-being.

However, some studies show contradictions. Fatemeh Ghaedi Heidari et al. (2022) reported no significant direct relationship between resilience and anxiety, viewing resilience as a trait rather than a process. Within the SCT framework, the effect of resilience may weaken if individuals have low cognitive beliefs and lack social support. Lenzo et al. (2024) showed that resilience does not

consistently reduce anxiety but is influenced by prior psychological conditions and environmental context. Lei et al. (2025) found that only the strength aspect significantly predicts lower anxiety, while optimism and tenacity were not significant. Shabani et al. (2023) reported that resilience affects anxiety only through mediating variables.

The researchers argue that resilience has a crucial but not absolute adaptive function in reducing anxiety. Through the lens of Bandura's (1986) SCT, resilience serves as a behavioral mechanism that enables anxiety management through self-regulation, reflection, and adaptation. However, the effectiveness of resilience depends on psychosocial context, prior emotional conditions, and supporting resources such as social support and self-efficacy. Resilience is dynamic and situational, functioning protectively only when aligned with cognitive and environmental factors that support adaptive coping processes.

Self-efficacy does not play a significant direct role on anxiety despite the negative coefficient being consistent with theory. This finding appears contradictory to Bandura's theory, which states that individuals with high self-efficacy have better abilities to face challenges (Van Lange et al., 2012). Within the SCT framework (Bandura, 1986; 1997), self-efficacy is a personal cognitive factor that influences how one thinks, feels, and acts, but its influence on emotions is heavily affected by cognitive context, environment, and learning experiences. Bandura (2006) emphasizes that self-efficacy beliefs work effectively when individuals have social support and adequate opportunities for behavioral control. For diabetic patients, external factors such as medical pressure, prognostic uncertainty, and limited emotional support can still trigger anxiety despite having high self-efficacy.

This finding contradicts literature showing direct relationships. Kheirkhah et al. (2023) found that self-efficacy training in women with gestational diabetes significantly reduced anxiety ($p < 0.001$). Li and Guo (2024) reported that diabetic patients with high self-efficacy have better stress management abilities and show significant anxiety reduction. However, Shahrbabaki et al. (2024) found a non-significant relationship between self-efficacy and anxiety ($P = 0.31$). Trisnaningati (2021) showed that individuals with high self-efficacy are not always free from anxiety, especially when facing intense psychological pressure. Paersch et al. (2024) demonstrated that the protective role of self-efficacy varies depending on situational context and other psychological mechanisms. Ataya et al. (2024) found that self-efficacy is negatively related to emotional distress but is mediated by factors such as social support and coping strategies.

The non-significance can be understood from the complexity of chronic disease psychological dynamics. Anxiety is often influenced by external factors difficult to control, such as uncertainty about complications, financial burden, or social stigma (Inagaki et al., 2022). The contradiction between Bandura's (1997) theory and empirical results shows inconsistency between theoretical models focusing on control behavior and clinical reality with external factors beyond patients' control. High self-efficacy without positive outcome expectancy can trigger anxiety when individuals realize limitations in controlling biological conditions.

This finding confirms that self-efficacy does not automatically reduce anxiety but works through intermediate psychological mechanisms such as growth mindset, which translates self-efficacy into emotional calm (Bandura, 1997). The p-value approaching the significance threshold indicates a marginal effect that may be significant in larger samples or different contexts. The mediating role of growth mindset appears more dominant in explaining the mechanism of anxiety reduction.

The Role of Resilience and Self-Efficacy on Growth Mindset in Diabetes Mellitus Patients

Resilience plays a significant role on growth mindset with a large effect size. From the SCT perspective, adaptive behavior from coping experiences (resilience) interacts with personal cognitive aspects through reciprocal determinism (Bandura, 1986). Individuals with successful experiences in overcoming health challenges build positive views toward the ability to develop.

Bandura (2001) explains that success experiences strengthen self-reflective processes that foster beliefs that abilities can be developed. Piaget's (1976) cognitive theory states that based on experience, individuals construct new knowledge and cognitive structures. Resilience facilitates cognitive construction processes that support growth mindset through accommodation and assimilation (Rabindran dan Madanagopal 2020).

This finding is supported by Iqbal et al. (2021), who found a strong positive correlation between resilience and growth mindset. Jianping et al. (2024) showed that highly resilient individuals contribute directly to growth mindset. Mei et al. (2023) found that psychological resilience contributes to adaptive thinking patterns. Jalalian-Chursky and Tausen (2024) showed that resilience training effectively forms resilient and developing mindsets. Zulkifli et al. (2024) revealed that resilience helps chronic disease patients change their perspective on challenges. Kusnanto et al. (2022) showed that resilience plays a role in growth mindset in diabetic patients, resulting in improved coping, condition acceptance, and quality of life. Boullion et al. (2021) emphasized that resilience experiences facilitate cognitive changes consistent with growth mindset.

Nevertheless, the majority of literature highlights the opposite direction of relationship. Boullion, Withers, and Lippmann (2021) found that growth mindset facilitates psychological resilience. Edwina and Sembiring (2021) reported that the higher the growth mindset, the higher the resilience. Ramadhona et al. (2025) found growth mindset as a significant predictor of psychological resilience. Macnamara and Burgoyne (2023), in a meta-analysis, found that growth mindset tends to be statistically non-significant, influenced by publication bias, weak research designs, and lack of mindset change verification.

The researchers argue that resilience functions as an important foundation for growth mindset, although the direction of relationship is not always linear and represents single causality. Experiences of successfully overcoming health challenges build confidence in developable abilities, but literature also shows that growth mindset can support resilience, so the relationship is mutually influential and contextual depending on patient characteristics, disease type, and coping experiences.

Self-efficacy plays a significant role on growth mindset with a moderate effect size. This finding supports the theoretical assumption that self-efficacy contributes to how individuals interpret health challenges as learning and adaptation opportunities. Consistent with SCT (Bandura , self-efficacy functions as the main source of belief system formation about the ability to learn and change (Bandura, 1997). Individuals with high self-efficacy tend to view challenges as opportunities to develop, consistent with growth mindset principles. Bandura (1997) explains four sources of self-efficacy: mastery experiences, vicarious experiences, verbal persuasion, and physiological states. Wangwongwiroj and Yasri (2021) found that these sources, especially mastery experience and verbal persuasion, can form and strengthen growth mindset.

This finding is consistent with Fu and Kartal (2023), who showed that self-efficacy plays a significantly positive role in forming growth mindset. Peng and Zhang (2025) reported a mediation coefficient ($\beta \approx 0.20$, $p < .001$), showing that increased self-efficacy contributes to growth mindset. Olsen et al. (2025) proved self-efficacy as a resource that encourages developing mindset. Bai, Wang, and Nie (2020) found that high self-efficacy contributes to growth mindset by providing internal encouragement to face positive challenges. Gál and Kerekes (2025) confirmed that self-efficacy is an important factor in the ecosystem that contributes to growth mindset. Sari et al. (2024) showed that self-efficacy has a significantly positive effect on growth mindset ($\beta = 0.371$; $p = 0.028$). Lo et al. (2023) found a positive correlation between self-efficacy and growth mindset in diabetes mellitus patients.

However, Wangwongviroj and Yasri (2021) reported that although mastery experience and verbal persuasion play a role in forming growth mindset, the relationship remains weak ($r \approx 0.3–0.4$), showing that efficacy components alone are insufficient to strongly build a growth mindset.

The majority of research directs growth mindset as a predictor, meaning growth mindset can increase efficacy, not vice versa. Zhao et al. (2023) showed that self-efficacy comes after growth mindset. Yu et al. (2025) showed that growth mindset plays a positive role on health self-efficacy. Prihandoko et al. (2024) reported that growth mindset significantly influences self-efficacy and metacognition. Zega et al. (2025), found a weak relationship ($r = 0.284$; $p < 0.01$), so growth mindset improvement only contributes minimally to self-efficacy.

The researchers argue that self-efficacy serves as an important psychological foundation in forming growth mindset, but the relationship is reciprocal and influenced by social context and learning experiences. Confidence in one's abilities enables patients to interpret disease management challenges as opportunities to develop, consistent with Bandura's SCT. However, findings that growth mindset can also increase self-efficacy indicate that both constructs mutually reinforce dynamically, not in a unidirectional relationship. Increasing self-efficacy needs to be accompanied by cultivating a growth mindset so patients are not only confident in their abilities but also flexible in facing learning and adaptation processes.

The Role of Growth Mindset on Anxiety Levels in Diabetes Mellitus Patients

Growth mindset plays a highly significant role on anxiety with a very large effect size. Patients with high growth mindset tend to accept their condition, view disease management challenges as learning opportunities, and are not easily trapped in excessive fear of complications. The large effect size positions growth mindset as the strongest predictor of anxiety, confirming its role not only as a psychological protective factor but as a key aspect that substantially affects emotional stability and patients' adaptive readiness.

Based on SCT (Bandura, 1986; 2006), growth mindset represents a personal cognitive factor that plays a role in self-regulation and emotional control. Individuals with growth mindset have the belief that abilities can be developed through effort, so they tend to interpret chronic disease challenges as learning and adaptation opportunities, not threats. The reciprocal determinism mechanism explains the interaction between personal factors (self-efficacy, and growth mindset), behavior (resilience), and environment (support in the form of facilities and infrastructure) contributes to anxiety reduction through strengthening control perception. This theory aligns with Beck's Cognitive Behavioral Theory, which emphasizes that thinking patterns greatly influence emotions and behavior (Pössel & Smith, 2020). Growth mindset serves as a protective cognitive schema, helping individuals reinterpret difficult situations adaptively, suppressing catastrophic thinking tendencies that trigger anxiety.

Schroder (2021) explains that growth mindset provides positive influence on anxiety through several mechanisms (Hoyt et al., 2023): (1) reframing failure as learning, (2) increasing tolerance for uncertainty, (3) reducing fear of negative evaluation, and (4) promoting approach-oriented coping strategies. This finding is consistent with various empirical studies. Zhu et al. (2025) found that growth mindset plays a significant role in reducing anxiety. Lai et al. reported a significant relationship ($\beta = -0.053$, $p = 0.004$). Zhang et al. (2021) showed that growth mindset is significantly associated with anxiety symptom reduction of 9.6%–12.6%. Yang et al. (2025) with 3,114 respondents found that growth mindset is associated with better anxiety symptom management. Henshaw et al. (2023), through a 4-wave longitudinal survey, showed that growth mindset contributes to subsequent anxiety reduction, supporting a causal relationship. Burnette et al. (2020), in a meta-analysis, showed a negative relationship between growth mindset and psychological distress ($r = -0.220$). Huang et al. (2022) found that growth mindset at T1 predicts lower psychological distress at T2. Smith and Capuzzi (2019) showed that mindset change significantly correlates with anxiety reduction ($r = 0.40$, $p = 0.007$). Hoyt et al. (2021) with 1,761 respondents revealed that growth mindset positively relates to various well-being indicators.

However, Altunel (2019) found no significant relationship between growth mindset and anxiety, explaining that anxiety is more influenced by situational factors such as experience and self-competence perception. Nagy et al. (2023) found that growth mindset does not produce significant effects on anxiety, indicating mindset changes are insufficient to modulate emotional responses to failure. Yang et al. (2024), in a meta-analysis, showed that growth mindset does not directly play a significant role on anxiety because its effect heavily depends on moderator variables (age, domain, intervention type). Ball et al. (2025), in a randomized controlled trial, showed that single-session online growth mindset interventions did not produce significant effects on anxiety symptom reduction.

The researchers argue that growth mindset plays an important role in reducing anxiety through complex cognitive and emotional mechanisms. Growth mindset not only forms beliefs about developable abilities but also strengthens self-control perception and competence feelings crucial in facing disease. Patients with growth mindset tend to interpret diabetes management challenges as continuous learning processes, not threats to self-worth. However, growth mindset's effectiveness on anxiety highly depends on contextual factors such as social support, disease duration, and prior failure experiences. Differing results in some studies indicate that growth mindset's influence on anxiety is indirect, mediated by variables such as self-efficacy, coping strategies, or resilience. Growth mindset is a psychological foundation that strengthens other adaptive mechanisms, not the sole determinant of anxiety reduction.

Growth Mindset Mediates the Role of Resilience on Anxiety Levels in Diabetes Mellitus Patients

Growth mindset plays a significant role in mediating the relationship between resilience and anxiety, indicating partial mediation where resilience still directly affects anxiety, but part of its influence is channelled through growth mindset. Based on Bandura's (1986), riadic reciprocal determinism model, behavior (resilience) and personal cognition (growth mindset) mutually influence in regulating emotions and psychological outcomes (anxiety). Resilient patients form mindsets that abilities can be enhanced, which subsequently reduces anxiety because individuals feel capable of learning and adapting. Growth mindset strengthens the regulative function of resilience through reinterpretation of experiences into self-development opportunities, serving as a psychological bridge that transforms adaptive behavior into emotional stability.

This theory aligns with Piaget's (1976) cognitive theory and Beck's (1976) Cognitive Behavioral Theory. Piaget states that intelligence and thinking patterns are formed from individuals' active interaction with their environment, allowing the emergence of developing thinking structures from experience. Resilience experiences function as concrete experiences that form new cognitive structures. Beck's CBT emphasizes that thinking patterns influence emotions and behavior. Growth mindset as a cognitive mediator changes how resilient individuals face stressors. When resilient diabetic patients have growth mindset, they see challenges as learning opportunities rather than threats, thus reducing anxiety (Pössel & Smith, 2020).

Although research explicitly testing growth mindset mediation in the resilience-anxiety relationship remains limited, several studies provide indirect support. Aquaimba et al. (2024) showed that growth mindset plays a positive role from resilience in reducing anxiety, indicating a mediation role. Boullion et al. (2021) emphasized that resilience experiences facilitate cognitive changes consistent with growth mindset, impacting psychological outcomes such as anxiety. Rabindran and Madanagopal (2020) and Nyamekye et al. (2025) confirmed that experience plays a role in cognitive construction processes. Resilience experiences when facing anxiety strengthen individuals' cognitive processes, forming thinking patterns that support growth mindset. Moore (2024) stated that resilience in adult patients with chronic diseases is characterized by adaptability and internal motivation, enabling individuals to respond constructively to difficulties, aligned with growth mindset formation processes. Kusnanto et al. (2022) showed that resilience plays a role in

growth mindset about disease management, resulting in improved coping and condition acceptance, mechanisms that reduce anxiety. Zhang et al. (2020) found that resilience is a significant protective factor against anxiety, and this mechanism can be mediated by cognitive factors such as mindset.

However, there are inconsistencies with some studies. Dasol Pyo et al. (2024) found that growth mindset's mediation effect does not show significant consistency across all analyzed subcomponents. Saidah et al. (2021) found that growth mindset does not significantly mediate relationships between main variables. These findings indicate that growth mindset's role as mediator is limited and not universally applicable. Boullion et al. (2021) showed contradictory directional patterns, where growth mindset serves as a direct predictor of resilience, challenging the assumption that adaptive experiences always precede mindset changes. In the SCT theoretical context, this difference illustrates reciprocal interaction between behavioral and cognitive factors.

The partial mediation finding provides deep understanding of mechanisms by which resilience works in reducing anxiety. Resilience does not automatically reduce anxiety but is channeled through cognitive transformation in the form of growth mindset formation. Experiences of successfully bouncing back from difficulties (resilience) teach patients that they are capable of developing and learning from challenges (growth mindset), thus reducing threat interpretation, and lowering anxiety. The significant mediation effect shows that cognitive mechanisms play important roles in translating psychological capacity (resilience) into more positive emotional outcomes. Statistically, indirect effects through growth mindset tend to be smaller than direct effects because mediation effects are products of two causal paths (Baron & Kenny, 1986), resilience on growth mindset × growth mindset on anxiety. This does not mean growth mindset's role is weak but shows that cognitive mechanisms work gradually and complement resilience's direct influence, functioning as psychological pathways that deepen, not replace, resilience's effect on anxiety.

The researchers argue that growth mindset serves as a cognitive mechanism that supports resilience strengthening in reducing anxiety. Although mediation pathways are not always consistent across all studies, these findings confirm that patients with high resilience who possess growth mindset can see challenges as learning opportunities, thus obtaining additional psychological protection against anxiety. Differing results confirm that growth mindset's role is contextual and depends on patients' adaptation phases, individuals' interaction with environment, and concrete experiences that shape mindset. Growth mindset is not merely a passive mediator but an active component that transforms adaptive behavior into emotional stability.

Growth Mindset Mediates the Role of Self-Efficacy on Anxiety in Diabetes Mellitus Patients

Research results show that growth mindset fully mediates the relationship between self-efficacy and anxiety in diabetes mellitus patients. Self-efficacy does not play a significant direct role on anxiety but becomes significant through growth mindset mediation, indicating full mediation. This finding aligns with Bandura's (1986) Social Cognitive Theory, which emphasizes reciprocal determinism among personal factors (self-efficacy), cognitive (growth mindset), and psychological outcomes (anxiety). Self-efficacy becomes the basis of belief that actions produce changes, while growth mindset expands that belief that abilities can continue to improve (Bandura, 1997; Dweck, 2006). Patients with high self-efficacy and growth mindset tend to view failure as a learning process, not inability, thus reducing self-blame and enhancing emotional regulation through self-reflective agency (2006).

Bandura (1986; 1997: 2001) emphasizes that self-efficacy does not always provide direct influence but works through cognitive mechanisms. Growth mindset mediates by changing self-ability interpretation. Patients with high self-efficacy see ability as something developable (growth mindset), reducing anxiety because they believe they can overcome challenges. Without growth mindset, high self-efficacy may not be sufficient if individuals still view ability as fixed.

Although studies explicitly testing growth mindset mediation remain limited, several studies provide indirect support. Lo et al. (2023) found a positive correlation between self-efficacy and growth mindset in diabetes mellitus patients. T. F. Smith and Capuzzi (2019) revealed that mindset changes significantly correlate with anxiety reduction, indicating growth mindset as mediator. Wangwongwiroj and Yasri (2021) found that self-efficacy sources such as mastery experience and verbal persuasion can form growth mindset. Hoyt et al. (2021) showed that growth mindset toward anxiety effectively reduces negative impacts and strengthens the ability to cope adaptively.

However, some literature finds opposite directions, where self-efficacy comes after growth mindset (Zhao et al., 2023; Prihandoko et al., 2024; Yu et al., 2025). Theoretically, this appears contradictory to Bandura's (1986; 1997), Social Cognitive Theory, which positions self-efficacy as the core of personal factors. However, this difference can be understood from cognitive function perspectives: growth mindset serves as reflective belief oriented toward self-development, while self-efficacy describes confidence in actual capacity. Their relationship is dynamic and contextual. In diabetes mellitus contexts, growth mindset can become the foundation for emerging self-efficacy because belief in learning potential provides psychological basis for feeling capable of managing disease.

Growth mindset's role as full mediator confirms the importance of cognitive mechanisms in anxiety management. Self-efficacy does not automatically reduce anxiety without growth mindset that forms positive interpretation toward abilities and learning processes. Growth mindset enables patients to view challenges as self-development opportunities, so self-efficacy's protective effect manifests through adaptive thinking patterns. This phenomenon shows that high self-efficacy alone is insufficient without growth mindset, especially in chronic diseases requiring long-term adaptive thinking.

Implications

The findings of this study have significant theoretical and practical implications in the fields of psychology and health, particularly in the context of managing chronic diseases such as diabetes mellitus. Theoretically, the results of this study expand the humanistic approach in psychology for the application of Social Cognitive Theory (Bandura, 2012) by showing that the interaction between personal factors (self-efficacy), adaptive behavior (resilience), and cognitive factors (growth mindset) plays an important role in reducing anxiety. Growth mindset has been proven to be the main psychological mechanism that bridges the influence of resilience and self-efficacy on anxiety, thereby broadening our understanding of the cognitive processes that underlie an individual's ability to cope with the emotional stress caused by chronic illness. Furthermore, this study extends the relevance of the growth mindset theory from the educational realm to the clinical context, emphasizing that a growth mindset functions as a reflective cognitive strategy that supports patients' adaptation and emotion regulation processes. Practically, the results of this study provide a basis for the development of growth mindset-based psychoeducational interventions focused on strengthening resilience and self-efficacy to reduce anxiety and improve patients' adaptive abilities in managing their chronic conditions. Thus, the implications of this study emphasize the importance of a psychological approach that not only targets the control of physical symptoms but also the transformation of mindset as the foundation for emotional well-being and the success of sustainable disease management.

Limitations and Further Research

This study has several limitations that need to be considered when interpreting the results. First, the sample size was limited to diabetes mellitus patients in three hospitals in Kediri, so generalizing the findings to a wider population with different socio-cultural backgrounds should be done with caution. Second, the cross-sectional study design did not allow for a definitive causal

relationship between the variables studied. Third, the measurement instruments used were general in nature and not fully contextualized to the specific experiences of diabetic patients, thus potentially introducing bias in the interpretation of respondents' psychological conditions. In addition, this study only focused on three main variables: resilience, self-efficacy, and growth mindset without considering other psychological factors such as coping strategies, social support, or emotional regulation, which can also play an important role in reducing anxiety.

Therefore, future research should use an experimental design to test the causal relationship between variables in greater depth, involve a population with more diverse characteristics, and develop instruments that are more specific and relevant to the clinical context of patients with diabetes mellitus. Future research is also expected to add other moderator or mediator variables, such as social support and coping strategies, to enrich our understanding of the psychological mechanisms that contribute to anxiety reduction in patients with chronic diseases.

CONCLUSION

The conclusion of this research is that resilience showed a significant negative effect on anxiety, while self-efficacy demonstrated a non-significant negative effect. Resilience and self-efficacy exhibited significant positive effects on growth mindset, and growth mindset demonstrated the strongest negative effect on anxiety. Growth mindset partially mediated the role of resilience on anxiety and fully mediated the role of self-efficacy on anxiety. Growth mindset functions as an active psychological mechanism in reducing anxiety related to disease burden. These findings provide important implications that psychological interventions for managing anxiety in diabetes mellitus patients are insufficient by focusing only on strengthening resilience or self-efficacy separately but require integrative approaches emphasizing growth mindset formation. Patients who view disease management abilities as something continuously developable through effort and learning will be more capable of facing challenges, reducing threat interpretation, and lowering anxiety levels. Thus, developing growth mindset-based intervention programs has potential to significantly improve quality of life and psychological well-being of diabetes mellitus patients.

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AUTHOR CONTRIBUTIONS STATEMENT

The first author (IPA) contributed to the literature review, identification of research gaps, translation and adaptation of the instruments, coordination of expert validation, research instrument development, data collection and analysis, interpretation of findings, and drafting of the manuscript under the supervision of the advisor. The second author (HBU) contributed to research conceptualization, methodological supervision, validation of the theoretical framework, critical review of intellectual content, proofreading, and manuscript revision. The third author (NS) contributed to supervision of the instrument translation and adaptation process, coordination of expert validation, research instrument development, supervision of data analysis, and manuscript review and revision. All authors have read and approved the final version of the manuscript for publication.

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