Journal of Medical and Health Research Insights (JMHRI)
http://www.jmhri.com/index.php/ojs
Volume 3, Issue 1 (2025)
ISSN PRINT: 3106-6992 ISSN ONLINE: 3106-700X

EXPLORING PATIENT COMPREHENSION AND ADHERENCE TO DIABETES SELF-MANAGEMENT PROGRAMS

Khalid Aziz Zia
Alzibat Rani Medical and Allied Health Science College, Mardan
Email aziz_111@gmail.com

Abstract:
Diabetes mellitus is a chronic metabolic disorder requiring continuous self-management to prevent complications and maintain glycemic control. Diabetes self-management programs are widely implemented to educate patients about diet, physical activity, medication adherence, blood glucose monitoring, and complication prevention. Despite the availability of structured programs, patient comprehension and adherence remain inconsistent, contributing to poor clinical outcomes. This study explores the relationship between patient comprehension and adherence to diabetes self-management programs using structural equation modeling with Smart PLS. A cross-sectional analytical design was conducted among 300 adult patients diagnosed with type 2 diabetes attending outpatient clinics. Patient comprehension was assessed through validated knowledge assessment questionnaires covering disease understanding, medication use, lifestyle modifications, and glucose monitoring. Adherence was measured using self-reported medication adherence scales, dietary compliance indices, physical activity logs, and glycated hemoglobin levels. Smart PLS was employed to evaluate measurement reliability and examine the structural relationship between comprehension and adherence while controlling for age, educational level, and duration of diabetes. Results indicated a significant positive association between patient comprehension and adherence behaviors. The structural model explained 61 percent of variance in adherence outcomes. Higher comprehension scores were associated with improved medication compliance, better dietary control, increased physical activity, and lower glycated hemoglobin levels. The findings emphasize the importance of enhancing patient education strategies within diabetes self-management programs to improve long term outcomes. This research contributes to evidence-based healthcare planning by identifying comprehension as a key predictor of effective diabetes self-care.

Keywords: Diabetes Self-Management, Patient Comprehension, Adherence, Glycemic Control, Health Education, Chronic Disease Management

Introduction

Diabetes mellitus is one of the most prevalent chronic diseases worldwide, characterized by persistent hyperglycemia resulting from defects in insulin secretion, insulin action, or both. The International Diabetes Federation estimates that more than 500 million adults live with diabetes globally, with type 2 diabetes accounting for the majority of cases. The condition is associated with serious complications including cardiovascular disease, nephropathy, neuropathy, retinopathy, and premature mortality. Effective management requires continuous lifestyle modification, medication adherence, and regular monitoring.

Unlike acute conditions managed primarily by healthcare professionals, diabetes demands active participation from patients in daily decision making. Self-management includes monitoring blood glucose levels, adhering to medication regimens, maintaining balanced nutrition, engaging in regular physical activity, and recognizing symptoms of hypo or hyperglycemia. Diabetes self-management programs are structured educational interventions designed to equip patients with knowledge and skills necessary for effective disease control.

Despite widespread implementation of such programs, adherence rates remain suboptimal. Many patients struggle to translate knowledge into sustained behavior change. Poor adherence contributes to inadequate glycemic control and increased risk of complications. Research indicates that health literacy, cultural beliefs, psychological factors, and socioeconomic status influence self-management behaviors.

Patient comprehension refers to the extent to which individuals understand disease processes, treatment regimens, and lifestyle recommendations. Adequate comprehension is fundamental for informed decision making and behavioral adherence. Without clear understanding, patients may misinterpret instructions, misuse medications, or neglect preventive measures.

Health behavior theories such as the Health Belief Model and Social Cognitive Theory suggest that knowledge and perceived self-efficacy are critical determinants of adherence. Comprehension enhances perceived benefits of adherence and reduces perceived barriers. Furthermore, educational strategies tailored to individual learning needs may improve retention and application of information.

In clinical practice, diabetes education is often delivered through group sessions or brief consultations. However, variability in teaching methods and patient engagement may limit effectiveness. Assessing the relationship between comprehension and adherence can provide evidence to refine program design and delivery.

Structural equation modeling offers a robust analytical framework for examining complex relationships among latent constructs such as comprehension and adherence. Smart PLS is particularly suitable for healthcare research involving behavioral variables and moderate sample sizes.

This study aims to explore patient comprehension and its influence on adherence to diabetes self-management programs. The findings are expected to inform policy makers and clinicians in developing patient centered educational interventions that enhance long term glycemic control and reduce diabetes related complications.

Literature Review

Diabetes self-management education has been recognized as a cornerstone of effective diabetes care. According to the American Diabetes Association, structured education improves glycemic outcomes and quality of life. Powers et al. emphasized that ongoing support is essential for sustaining behavioral changes.

Studies demonstrate that higher health literacy is associated with better glycemic control. Schillinger et al. found that limited literacy predicted poor understanding of medication instructions and worse glycemic outcomes. Similarly, Bailey et al. reported that comprehension of prescription labels influenced medication adherence.

Medication adherence remains a critical challenge in diabetes management. A systematic review by Polonsky and Henry highlighted that approximately 45 percent of patients do not adhere fully to prescribed regimens. Factors contributing to non-adherence include complexity of treatment, side effects, cost, and inadequate understanding.

Dietary adherence is another essential component. Research indicates that patients who understand carbohydrate counting and portion control are more likely to maintain stable blood glucose levels. Physical activity adherence is influenced by knowledge of exercise benefits and perceived self-efficacy.

The Health Belief Model posits that perceived susceptibility, severity, benefits, and barriers influence health behaviors. Comprehension enhances perceived benefits and reduces misconceptions. Social Cognitive Theory emphasizes the role of observational learning and self-efficacy in sustaining behavior change.

Educational interventions incorporating interactive teaching methods, visual aids, and culturally appropriate materials have demonstrated improved comprehension and adherence. Norris et al. reported that self-management education significantly reduced glycated hemoglobin levels compared to usual care.

Smart PLS has been used in healthcare research to model behavioral determinants of adherence. Its ability to assess measurement reliability and structural relationships makes it appropriate for evaluating educational program effectiveness.

Although existing literature supports the importance of patient education, limited research has quantitatively modeled the direct relationship between comprehension and multidimensional adherence outcomes using structural equation modeling. This study addresses that gap.

Conceptual Model and Theoretical Framework

The conceptual model identifies Patient Comprehension as an exogenous latent construct measured by Disease Knowledge, Medication Understanding, Lifestyle Awareness, and Glucose Monitoring Skills. Adherence Behavior is an endogenous latent construct measured by Medication Compliance, Dietary Adherence, Physical Activity Participation, and Glycated Hemoglobin Control. Age, Educational Level, and Duration of Diabetes serve as control variables.

The theoretical framework integrates the Health Belief Model and Social Cognitive Theory, proposing that comprehension enhances perceived benefits and self efficacy, leading to improved adherence behaviors.

Methodology

A cross-sectional analytical study was conducted among 300 adults with type 2 diabetes enrolled in self-management programs at outpatient clinics. Inclusion criteria included diagnosis for at least one year and participation in educational sessions.

Data were collected using validated questionnaires assessing comprehension and adherence behaviors. Glycated hemoglobin levels were obtained from medical records.

Smart PLS version 4 was used for structural equation modeling. Reliability was evaluated using Cronbach alpha and composite reliability. Convergent validity was assessed through average variance extracted. Bootstrapping with 5000 resamples determined statistical significance of path coefficients.

Analysis

Table 1 Measurement Model Results

Construct	Indicator	Loading	Cronbach Alpha	Composite Reliability	AVE
Patient Comprehension	Disease Knowledge	0.89	0.92	0.95	0.82
	Medication Understanding	0.91			
	Lifestyle Awareness	0.88			
	Glucose Monitoring Skills	0.90			
Adherence Behavior	Medication Compliance	0.87	0.90	0.94	0.79
	Dietary Adherence	0.85			
	Physical Activity	0.88			
	HbA1c Control	0.92			

Interpretation of Table 1

The measurement model demonstrates strong psychometric properties. All indicator loadings exceed 0.85, confirming that observed variables reliably represent their respective latent constructs. Disease knowledge and medication understanding exhibit particularly high loadings, indicating strong contribution to overall comprehension.

Cronbach alpha values above 0.90 indicate excellent internal consistency. Composite reliability values above 0.94 further validate construct stability. Average variance extracted values exceed 0.50, confirming convergent validity.

These results establish reliability and validity of the measurement model, supporting

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progression to structural analysis.

Table 2 Structural Model Results

Path	Beta	T Value	P Value	R Square
Patient Comprehension to Adherence Behavior	0.78	14.02	0.000	0.61
Age to Adherence	-0.16	2.45	0.014	
Educational Level to Adherence	0.22	3.67	0.000	
Duration of Diabetes to Adherence	-0.19	2.98	0.003	

Interpretation of Table 2

The structural model reveals a strong positive relationship between Patient Comprehension and Adherence Behavior with a beta coefficient of 0.78. This indicates that higher comprehension significantly predicts improved adherence across medication, diet, physical activity, and glycemic control.

The R square value of 0.61 suggests that 61 percent of variance in adherence behavior is explained by comprehension and control variables. Educational level shows a positive association with adherence, while age and longer disease duration are negatively associated. The high T value and significant P value confirm statistical robustness. Comprehension emerges as the strongest predictor, underscoring the critical role of effective patient education.

Conclusion

The study demonstrates that patient comprehension significantly influences adherence to diabetes self-management programs. Enhanced understanding of disease processes and treatment regimens leads to improved behavioral compliance and glycemic outcomes.
Discussion and Future Recommendations

These findings highlight the necessity of patient centered educational strategies that address literacy levels and cultural contexts. Healthcare providers should incorporate interactive learning methods, digital tools, and continuous support mechanisms to reinforce comprehension.

Future recommendations

Future longitudinal research is recommended to assess causal relationships and evaluate impact of tailored educational interventions on long term complication rates. Integration of technology-based monitoring systems may further enhance adherence and disease control.

References

Ali, M. K., et al. 2013. Quality of diabetes care. Lancet, 382, 1684 1696.

American Diabetes Association. 2023. Standards of care in diabetes. Diabetes Care, 46, S1 S300.

Baig, A. A., et al. 2015. Culturally tailored interventions. Diabetes Care, 38, 177 183.

Bailey, S. C., et al. 2014. Literacy and medication understanding. Annals of Internal Medicine, 160, 13 21.

Bandura, A. 2004. Social cognitive theory. Health Education and Behavior, 31, 143 164.
Beverly, E. A., et al. 2013. Patient education impact. Clinical Diabetes, 31, 86 92.
Chrvala, C. A., et al. 2016. DSME effectiveness meta analysis. Patient Education and Counseling, 99, 926 943.
Fisher, E. B., et al. 2012. Peer support in chronic disease. Annals of Family Medicine, 10, 152 160.
Funnell, M. M., et al. 2009. Empowerment approach. Diabetes Educator, 35, 134 145.
Glanz, K., et al. 2015. Health behavior theory. Jossey Bass.
Heisler, M., et al. 2010. Collaborative goal setting. Annals of Family Medicine, 8, 128 137.
Hill Briggs, F., et al. 2021. Social determinants and diabetes. Diabetes Care, 44, 258 279.
International Diabetes Federation. 2023. IDF Diabetes Atlas.
Nam, S., et al. 2011. Barriers to diabetes management. Diabetes Research and Clinical Practice, 93, 1 9.
Norris, S. L., et al. 2002. Self management education review. Diabetes Care, 25, 1159 1171.
Osborn, C. Y., et al. 2010. Self efficacy and adherence. Health Psychology, 29, 82 88.
Peyrot, M., et al. 2012. Psychosocial problems in diabetes. Diabetes Care, 35, 2193 2199.
Polonsky, W. H., and Henry, R. R. 2016. Poor medication adherence. Patient Preference and Adherence, 10, 1299 1307.
Powers, M. A., et al. 2020. Diabetes self management education. Diabetes Care, 43, 1636 1649.
Riddle, M. C., et al. 2018. Glycemic targets. Diabetes Care, 41, 157 169.
Schillinger, D., et al. 2002. Health literacy and outcomes. JAMA, 288, 475 482.
Shrivastava, S. R., et al. 2013. Role of self care. Journal of Diabetes and Metabolic Disorders, 12, 14.
Tang, T. S., et al. 2014. Peer support interventions. Diabetes Care, 37, 152 159.
Walker, R. J., et al. 2014. Adherence predictors. Patient Preference and Adherence, 8, 1299 1310.
World Health Organization. 2023. Global report on diabetes. WHO Publications.