IJARSCT
International Journal of Advanced Research in Science, Communication and Technology
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
ISSN: 2581-9429
Volume 5, Issue 2, December 2025
Impact Factor: 7.67

Assess the Effectiveness of Continuous Glucose Monitoring Device in Early Detection and Prevention of Glycemic Variability among Diabetes Patients

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Abstract: *Diabetes mellitus is a chronic metabolic disorder that requires continuous monitoring to prevent acute and long-term complications. Traditional intermittent finger-prick testing often fails to capture real-time glucose fluctuations, leading to missed hypoglycemic and hyperglycemic episodes. Continuous Glucose Monitoring (CGM) devices provide dynamic glucose trends that support early detection and improved self-management. This study aimed to assess the effectiveness of CGM in detecting glycemic variability and enhancing glycemic stability among early-diagnosed diabetic patients at SIMS Hospital, Vadapalani, Chennai.* ***Methods:*** *A pre-experimental one-group pretest–posttest design was employed. Early-diagnosed diabetic patients meeting the inclusion criteria were selected through purposive sampling. Baseline glycemic parameters—fasting glucose, postprandial glucose, and HbA1c—were recorded prior to CGM implementation. Participants were monitored using a CGM device for a specified period. Post-intervention glycemic data were compared with baseline values. Descriptive and inferential statistics, including paired t-test, were applied to evaluate the effectiveness of CGM in reducing glycemic variability.* ***Results:*** *CGM revealed previously undetected glycemic fluctuations, including nocturnal hypoglycemia and postprandial spikes in over 60% of participants. Mean fasting glucose levels improved after CGM use, and time-in-range increased significantly. HbA1c values showed improvement in a majority of patients following CGM-guided lifestyle and medication adjustments. Participants reported enhanced diabetes awareness, better adherence to diet and medication, and improved confidence in self-management.****Conclusion:*** *Continuous Glucose Monitoring is effective in early detection of glycemic variability, improving glycemic control, and enhancing diabetes self-management among newly diagnosed diabetic patients. Integration of CGM into routine diabetic care can reduce complications, improve clinical outcomes, and enhance overall quality of life.*

Keywords*:* Continuous Glucose Monitoring, Glycemic Variability, Diabetes Mellitus, Early Detection, Self-Management, Time-in-Range

DOI: 10.48175/568