

Brief Educational Intervention to Improve Medication Adherence & Glycemic Control in Adults with Persistent Poorly Controlled Type 2 Diabetes: A Quality Improvement Project

Chibuzo Nwigbo, MSN, FNP-C, BC-ADM; Rita D'Aoust, PhD, MS, RN, ACNP, ANP-BC, CNE, FAANP, FNAP, FAAN; Deborah Baker, DNP, MSN, RN, ACNP, NEA-BC, Caitlin Nass, MSN, CRNP



JOHNS HOPKINS
SCHOOL of NURSING

Background & Aims

- In the United States, 1 in 10 adults, have diabetes. Adults with diabetes are at 60% higher risk of early death¹. Diabetes medication nonadherence due to inadequate knowledge leads to poor glucose control and costly complications.

Project aims:

- Improve diabetes medication adherence
- Improve diabetes medication knowledge
- Improve blood glucose time-in-range

Methods

- Design:** Quality Improvement pre- and posttest one-group
- Setting:** diabetes center in the Northeast region of the U.S.
- Sample:** Adults with poorly controlled type 2 diabetes meeting inclusion and exclusion criteria.

Outcome Measures:

- **Medication Nonadherence:** Voils Medication nonadherence questionnaire, a validated 2-part scale with seven-day recall: 3-item extent of nonadherence: Likert scale & 18-item reasons for nonadherence
- **Medication Knowledge:** 5-item medication knowledge survey
- **Time-In-Range Percentage:** Calculated automatically by a CGM sensor, or manually using fingerstick BG results
- **IRB Approval:** Johns Hopkins Medicine
- **Statistical Analyses:** Descriptive statistics, Paired t-test, Wilcoxon signed rank, Chi-square

Intervention

- A personalized educational leaflet was designed containing medications used to treat type 2 diabetes, with key need-to-knows: how they work, common side effects, how and when to take them, what to do if a dose is missed or has side effects.
- Implementation involved 1:1 educational session using leaflet and teach-back method patient counseling conducted during participant's scheduled diabetes office visit.

Results: Aim I. Medication Adherence

Medication NonAdherence	Mean Score (SD)
Preintervention (N=15)	1.50 (0.39)
Postintervention (N=14)	1.40 (0.30)
Difference pre-post (N=14)	0.95 (0.42)
P-value	0.41

Reasons Endorsed for Medication Nonadherence	Baseline	Postintervention
I forgot	20%	50%
I did not have my medicines with me	7%	21%
I was asleep	7%	14%
I could not afford the medication	7%	7%
I ran out of medications	7%	7%
I was out of my routine	0%	7%
I could not meet the food requirements	0%	7%
My blood sugar was too low	0%	7%

Results: Aim 2. Medication Knowledge

	Mean Score (SD)
Baseline Knowledge (N=14)	5.43 (1.34)
12-weeks post intervention knowledge (N= 14)	7.57 (0.65)
Change in Knowledge	-2.14 (1.29)
P-value	0.00

Results:Aims 3. Time-in-Range

	Baseline TIR (N=15)	2-week post- TIR (N= 13)	12-week post-TIR (N= 12)	Difference Baseline & 2-weeks post TIR (N= 13)	Difference Baseline TIR & 12-weeks post TIR (N= 12)
Mean (SD)	47.67 (22.72)	55.31 (22.30)	52.50 (17.33)	9.38 (22.29)	4.67 (23.23)
Z				-1.43	-0.67
P-value				0.15	0.51

Conclusion

- Medication adherence decreased after the intervention, but this was not statistically significant
- Findings suggest an intervention to increase medication adherence other than education provided at regularly scheduled visits
- Incorporating brief educational intervention using leaflet and teach-back patient counseling improved medication knowledge.
- The intervention did not result in statistically significant increase in blood glucose time-in-range (TIR).
- Since each 5% increase in TIR is associated with clinically meaningful benefit according to the international consensus guidelines on TIR²; the intervention produced a clinically significant increase in TIR at 2 weeks post intervention.

References

- Centers for Disease Control and Prevention. (2020). *National Diabetes Statistics Report, 2020*. Atlanta, GA: Centers for Disease Control and Prevention, U.S. Dept of Health and Human Services; 2020. Retrieved from <https://www.cdc.gov/diabetes/library/features/diabetes-stat-report.html>
- Advani, A. (2020). Positioning time in range in diabetes management. *Diabetologia*, 242-252. <https://doi.org/10.1007/s00125-019-05027-0>