

Individualized Enhanced Adherence Intervention Study in Adults with Diabetes

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We would like to report an individualized enhanced adherence intervention study in adults with diabetes. Adherence to a diabetes regimen has led to investigations of behavior in the form of interventions designed to promote self-management. Bandura's social cognitive theory provides a comprehensive theoretical framework for the examination of human behavior.¹ Self-efficacy, defined by Bandura² is a belief in one's capabilities to successfully overcome the demands of a situation in order to achieve a desired outcome. It is a significant predictor of regimen adherence, including areas of blood glucose testing, exercise and diet, and glycemic control.⁴⁻⁶

We utilized a framework of social cognitive theory for our study, Bringing Diabetes General Education to Life (BRIDGE). We compared the effects of an individualized enhanced adherence intervention (IEAI) for individuals with Type 2 diabetes. We evaluated the effects of the adherence-based intervention (BRIDGE) on glucose control by analyzing SMBG, glycosylated hemoglobin (A1C), and fasting laboratory glucose in this pilot study. An intervention emphasizing follow-up SMBG, exercise and self-management techniques was utilized. Subjects were randomized into an attention control group or the IEAI group. In each of the months 1, 3, and 5, control group participants received a 1-hour educational session that emphasized material previously presented in diabetes education classes. Educational material was also mailed to these participants in the form of a newsletter during months 2 and 4. In contrast, those randomized into the IEAI group received a 6-month behavioral intervention consisting of a series of group and individual sessions. The aim of the program was to employ strategies and techniques for enhancing self-efficacy in carrying out a personal diabetes treatment plan. Blood glucose monitors (Accu-Chek Advantage®, Mannheim, Germany) were provided to the participants and uploaded by computer. Laboratory glucose and A1C by venipuncture were obtained at baseline, 3, and 6 month visits.

We analyzed data using SPSS (Version 11.5). Descriptive statistics were employed to characterize the sample, and simple independent measured t-tests were used to examine potential differences between the intervention and control groups at baseline. Analyses of covariance were performed for intervention versus control group at 3 and 6 months using baseline data as the covariate.

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In **Table 1** we present our baseline (no statistical difference between groups) and outcome variables. The A1C averages reveal that the control group increased from baseline by an average of approximately 0.5% compared to the intervention group's decreased average of about 0.2%. Morning glucose labs in the control group were at an average value of 144.8 ± 54 mg/dl compared to the intervention group that decreased to 101.5 ± 23.8 mg/dl. The intervention group performed SMBG 2.33 times per day, while the control group tested 1.39 times per day. A significant difference was found between groups at 3 months ($p < 0.05$). Those who underwent the intervention demonstrated greater mean SMBG daily testing (2.47 times per day) at month 3, in comparison to the control group (1.03 times per day, $p < 0.05$). This study indicates that an intervention based on social cognitive theory can have an impact on the behaviors necessary to improve glycemic control. According to Bandura, self-efficacy not only predicts behavior, but also the extent to which the behavior is executed. To read this study in its entirety, visit:

<http://www1.wfubmc.edu/NR/rdonlyres/10A98B0F-21D4-4C49-83C1-071BB0E0B803/0/BRIDGE12407.pdf>

Table 1.
Glycemia data for control and intervention (Mean \pm SD with 95% CI)

	Baseline	3-Month	6-Month
	SMBG \times 1 Week, mg/dl *		
Control	130.9 \pm 27.3 (112.3, 149.4)	143.0 \pm 29.3 (121.7, 164.3)	158.0 \pm 40.7 (131.5, 184.5)
Intervention	128.7 \pm 24.1 (107.6, 149.8)	132.7 \pm 30.5 (108.5, 156.9)	123.0 \pm 31.6 (93.0, 153.1)
	SMBG AM, mg/dl*		
Control	129.5 \pm 26.9 (108.1, 150.8)	143.4 \pm 28.3 (123.1, 163.5)	157.4 \pm 43.8 (130.2, 184.7)
Intervention	128.8 \pm 33.3 (104.6, 153.0)	125.3 \pm 27.7 (102.6, 148.0)	122.2 \pm 28.7 (91.3, 153.0)
	AM Lab Glucose mg/dl		
Control	131.6 \pm 37.4 (101.3, 162)	144.8 \pm 54.0 (110.9, 178.7)	142.4 \pm 62.3 (104.6, 180.2)
Intervention	135.3 \pm 42.1 (100.3, 170.4)	101.5 \pm 23.8 (62.4, 140.7)	107.7 \pm 18.6 (63.9, 151.4)
	Frequency of SMBG Testing †		
Control	1.39 (1.33, 156)	1.03‡ (0.78, 1.33)	1.43 (1.22, 1.56)
Intervention	2.33 (2.14, 2.57)	2.47‡ (2.29, 2.71)	2.06 (1.86, 2.57)
	Average A1C		
Control	6.9 \pm 0.5 (6.3, 7.5)	7.1 \pm 0.8 (6.5, 7.8)	7.4 \pm 1.0 (6.7, 8.1)
Intervention	7.0 \pm 1.0 (6.3, 7.6)	6.4 \pm 0.9 (5.7, 7.0)	6.8 \pm 0.8 (6.0, 7.5)

SMBG = Self-Monitoring Blood Glucose, CI = Confidence Interval, *Average SMBG in the morning 1 week prior to visit, †Average SMBG testing per day 1 week prior to visit, ‡ $p < 0.05$ at 3 months between intervention and control groups

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