



The Diabetes Garage Improves Diabetes Distress and Psychological Well-being among Mexican-American Men

Concha, JB.,¹ Schober G.,¹ Chacon-Portillo, DN.,¹ Sanchez, T.,² Ruiz Reyes de Holguin, R.,³ Romero R.L.,⁴ Villagomez, L.,⁵ Winkler, P.,⁶ Hernandez, L.,⁶ Lopez, A.,⁵ Escareno, J.,⁵

¹The University of Texas at El Paso, ² El Paso Children's Hospital, ³ Alliance of Border Collaboratives, ⁴ University of Texas Health Science Center San Antonio, ⁵ Lower Rio Grande Valley Area Health Education Center, ⁶ South Central Area Health Education Center

BACKGROUND

- Hispanics of Mexican background are disproportionately affected by the diabetes epidemic, with an estimated prevalence ranging between 14% to 18% compared to 7.4% among non-Hispanic whites.^{1,2,3}
- Mexican-American men, in particular, have high rates of diabetes, related complications, and mortality.⁴ Moreover, these men are underrepresented in diabetes education and management programs.⁵
- The Diabetes Garage (DG) is a culturally tailored program that uses automotive maintenance analogies, a Mexican-American subculture, to engage Hispanic men in diabetes programs and self-care.
- The DG is a diabetes self-management, education, and support program that includes a comprehensive session on psychological well-being.
- Diabetes distress and psychological well-being are important for diabetes self-care and glycemic management; however, few studies have focused on Hispanic men's emotional well-being.^{6,7}

OBJECTIVES

- Determine the impact that the DG has on diabetes distress and psychological well-being among men.

DATA AND METHODS

- A tailored diabetes education and self-management support program was designed in 2018 using automotive maintenance analogies to better explain diabetes to Hispanic men living with diabetes.
 - The program includes one 2-hour workshop for 4 weeks.
 - Includes topics: diabetes basics, physical activity, stress management, medication information, complications, and nutrition.
 - Family and friends are invited to the nutrition session
- Workshops were co-taught by CDCES educators and a community health worker/automotive technician
- A total of 25 workshops were delivered between 2018 through 2022, both in-person and online (N=201).
- Descriptive statistics, pre-post two tailed t-test assessments (matched –paired) were conducted to determine the impact on diabetes distress, psychological well-being, and self-efficacy in diabetes management.
- Measures:
 - Diabetes Distress Scale 17-item (6 point Likert scale)
 - Emotional Well-Being (6 point Likert scale)
 - Diabetes self management self-efficacy (6 point Likert scale)
 - Diabetes support self-efficacy (6 point Likert scale)
- Stata Statistical Software for Data Science was used for analysis

RESULTS

- Overall, men reported an average score of **moderate diabetes distress** at pre-test and statistically significant improvements in total diabetes distress, emotional burden, regimen –related distress, and interpersonal distress at the post-test assessment
- Men also reported feeling less nervous and anxious after having participated in the program. Anecdotal discussions revealed that men started the program feeling fearful and nervous about diabetes and the related complications.
- In addition, our results show statistically significant improvements in feeling calm and rested after participating in the DG program.
- Last, we found statistically significant improvements in men's self-efficacy regarding diabetes management and having the support and medical resources to manage diabetes.

Indicator	Mean/%
Age (n= 152)	Mean years= 57.65, Std. Dev. 12.08
Income (n=131)	
Less than 10,000-40,000	53.44%
40,001-70,000	23.66%
70,001-more than 100,000	22.90%
Education (n=157)	
Never attended school or Kindergarten	9.55%
Grades 1-12	38.21%
College 1-3 years	24.20%
College 4+ years	28.03%
Marital Status (n=156)	
Married/ member of unmarried couple	78.21%
Divorced/Widowed/Separated/ Never Married	21.80%
Employment Status (n=155)	
Employed	63.87%
Out of work/Student/Retired/ Unable to work	36.14%
Health Insurance (n=113)	
Yes	84.96%
No	15.04%

Psychological Health Indicators	n	Pretest mean and ±Standard Deviation	Post test mean and ±Standard Deviation	p-value
Diabetes Distress Scale (6-point Likert scale)				
Diabetes Distress (DD) Total Score	70	2.403 ± 1.030	1.933 ± .805	0.0000
DD Emotional burden subscale	78	2.556 ± 1.178	2.005 ± .982	0.0000
DD Physician related distress subscale	76	2.033 ± 1.277	1.984 ± 1.226	0.6484
DD Regimen-related distress subscale	78	2.923 ± 1.335	2.254 ± 1.019	0.0000
DD Interpersonal distress subscale	80	2.054 ± 1.266	1.708 ± .955	0.0039
Emotional well-being reported symptoms (6-point Likert scale)				
Symptoms: Nervous	80	.250 ± .436	.150 ± .359	0.0209
Symptoms: Sad	79	.354 ± .481	.278 ± .451	0.1088
Symptoms: Anxiety	82	.378 ± .488	.243 ± .432	0.0116
Symptoms: Boredom	76	.303 ± .462	.276 ± .450	0.6374
Psychological reports of well-being (6-point Likert scale)				
Felt Cheerful	102	3.529 ± 1.208	3.706 ± 1.113	0.1053
Felt Calm	102	3.431 ± 1.215	3.657 ± 1.085	0.0472
Felt Active	100	3.000 ± 1.463	3.280 ± 1.288	0.0680
Felt Rested	99	2.818 ± 1.459	3.232 ± 1.300	0.0011
Felt Interested	101	3.624 ± 1.057	3.812 ± 1.046	0.0848
Self-efficacy: Confidence in.... (6-point Likert scale)				
managing diabetes	98	3.990 ± .867	4.214 ± .777	0.0035
support/medical resources to manage diabetes	97	3.990 ± 1.005	4.216 ± .869	0.0402
Note: A DDS mean item score 2.0-2.9 indicates 'moderate distress' and a mean item score ≥ 3 indicates 'high distress'. ^{8,9}				

CONCLUSION

Mexican-American men benefit in their psychological well-being after participating in culturally automotive-centric tailored diabetes education and management program. The DG uses a strength based approach to inform men that they can still enjoy a good quality of life and avoid diabetes complications by managing glycemic levels within range. The implications in improving diabetes distress and psychological well-being 4 weeks post DG has the potential to improve diabetes self-care, physical and glycemic outcomes in the long term.

REFERENCES

- Schneiderman, N., Llabre, M., Cowie, C. C., Barnhart, J., Carnethon, M., Gallo, L. C., Giachello, A. L., Heiss, G., Kaplan, R. C., LaVange, L. M., Teng, Y., Villa-Caballero, L., & Avilés-Santa, M. L. (2014). Prevalence of diabetes among Hispanics/Latinos from diverse backgrounds: the Hispanic Community Health Study/Study of Latinos (HCHS/SOL). *Diabetes care*, 37(8), 2233–2239. <https://doi.org/10.2337/dc13-2939>
- Centers for Disease Control and Prevention. (2022, April 4). Hispanic or Latino people and type 2 diabetes. Centers for Disease Control and Prevention. <https://www.cdc.gov/diabetes/library/features/hispanic-diabetes.html>
- Centers for Disease Control and Prevention. (2022, September 30). Prevalence of diagnosed diabetes. Centers for Disease Control and Prevention. <https://www.cdc.gov/diabetes/data/statistics-report/diagnosed-diabetes.html#:~:text=For%20both%20men%20and%20women,2%3B%20Appendix%20Table%203>
- The Office of Minority Health. (2021, March 21). Office of Minority Health. Diabetes and Hispanic Americans. <https://minorityhealth.hhs.gov/omh/browse.aspx?lvl=4&lvlid=63>
- Testerman, J., & Chase, D. (2018). Influences on Diabetes Self-Management Education Participation in a Low-Income, Spanish-Speaking, Latino Population. *Diabetes Spectrum* : a publication of the *American Diabetes Association*, 31(1), 47–57. <https://doi.org/10.2337/ds16-0046>
- Eriksson, A. K., Ekblom, A., Granath, F., Hilding, A., Efendic, S., & Ostenson, C. G. (2008). Psychological distress and risk of pre-diabetes and Type 2 diabetes in a prospective study of Swedish middle-aged men and women. *Diabetic medicine : a journal of the British Diabetic Association*, 25(7), 834–842. <https://doi.org/10.1111/j.1464-5491.2008.02463.x>
- Twig, G., Gerstein, H. C., Fruchter, E., Shina, A., Afek, A., Derazne, E., Tzur, D., Cukierman-Yaffe, T., Amital, D., Amital, H., & Tirosh, A. (2016). Self-Perceived Emotional Distress and Diabetes Risk Among Young Men. *American journal of preventive medicine*, 50(6), 737–745. <https://doi.org/10.1016/j.amepre.2015.12.006>
- Polonsky, W.H., Fisher, L., Esarles, J., Dudl, R.J., Lees, J., Mullan, J.T., Jackson, R. (2005). Assessing psychosocial distress in diabetes: Development of the Diabetes Distress Scale. *Diabetes Care*, 28, 626-631.
- Fisher, L., Hessler, D.M., Polonsky, W.H., Mullan, J. (2012). When is diabetes distress clinically meaningful? Establishing cut-points for the Diabetes Distress Scale. *Diabetes Care*, 35, 259-264.