

Diabetes, Depression, and Metabolic Control in Latinas

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Diabetes is steadily becoming an epidemic among Latinos, and depression has been found to complicate diabetes management. This study examined depressive symptoms and metabolic control in Latinas with diabetes in a community clinic setting. The association of depressive symptoms with metabolic control was supported in this study. Social support (but not acculturation) was found to be associated with depressive symptoms. Finally, age and metabolic control were related. These findings are explained in a culture-specific framework. The authors speculate that the role of the woman in Latino families makes it difficult for a Latina to attend to her own care needs until she ages.

Keywords: diabetes, Latinas, depression, metabolic control, social support

Diabetes is reaching epidemic rates in this country, especially among Latinos. As many as 1 in 10 Latinos have diabetes, with estimates of the percentage of Latinos with diabetes ranging from 8.2% to 9.5% (American Diabetes Association, 2005; National Diabetes Education Program, 2005 respectively). Latinas (Hispanic females) that live in the United States have higher diabetes morbidity and mortality when compared to their non-Latino white counterparts and Mexican nationals (Baezconde-Garbanati, Portillo, & Garbanati, 1999). Elucidation of any possible factors that influence the management of diabetes is acutely needed because of the toll that poorly controlled diabetes takes on the individual's quality of life, and also because of accruing health care costs.

Diabetes and Depression in Latinas

There is strong empirical support for the association between diabetes and depression in U.S. non-Latino Whites (Anderson, Freedland, Clouse, & Lustman, 2001; Culpepper, 2002; Ludman et

al., 2004; Lustman et al., 2000). Depressive symptoms have been shown to be associated with poor glucose control, increased diabetic symptoms, unfavorable treatment adherence, and increased likelihood of the emergence of diabetic complications (Black, 1999; Ciechanowski, Katon, Russo, & Hirsch, 2003; Culpepper, 2002; Lustman et al., 2000). Depression severity has also been associated with hyperglycemia and hypoglycemia indicating improper glucose control (Anderson et al., 2001; Ciechanowski et al., 2003; Lustman et al., 2000; Van der Does et al., 1996). In addition, those living with diabetes for a longer amount of time are more likely to endorse more depressive symptoms than newly diagnosed patients.

Surprisingly, few studies have looked at depressive symptoms and their association with diabetic control in Latino groups. The results of a study that focused on older Mexican Americans (65 and older) with and without diabetes by Black (1999) demonstrated a significant gender difference in the group with diabetes in addition to the group without diabetes. Black (1999) also demonstrated a significant difference in depression score between the U.S.-born participants with diabetes and those that did not have diabetes. Comorbid chronic health conditions for participants with diabetes were higher among those with elevated depressive symptoms. Black proposed that the stress associated with diabetes and depression may be greater among Mexican American adults than non-Mexican Americans.

In another study of diabetes and depressive symptoms using data from the Hispanic Established Population for the Epidemiologic Study of the Elderly Survey, Black and colleagues (Black, Markides, & Ray, 2003) found that the risk of unfavorable outcomes (such as increased mortality, complications, and disability) increases with the severity of depression in patients with diabetes. Gross et al. (2005) found that 33.5% of the Latino patients with diabetes had symptoms in the moderate to severe range on a depression screening tool. Latina women with a low income and living alone were more likely to be depressed. In addition, the researchers found that the more depressed Latino participants were more likely to have poor control over their diabetes when compared to participants who did not report depressive symptoms. This finding was unique to Latino participants because an association

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was not found between glycemic control and depression in non-Latino participants.

Cultural Differences: Potential Risk Factors for Depression Among Latinas

Group (particularly familial) goals are emphasized by most Latinos, however, American culture emphasizes individual goals. Higher levels of family discord/dysfunction are related to elevated levels of depressive symptoms in Mexican Americans (Hovey & Magana, 2002). Mexican immigrants have smaller interaction networks than subsequent generations and are more likely to rely on family for emotional support when confronted with change and with stress; family support was one of the best predictors for low depression scores in immigrant Mexican women (Vega, Kolody, Valle, & Weir, 1991). For recent immigrants of various cultures, social support of others from the same mother country often alleviates symptoms of stress and fosters a sense of community and shared experience that often contrasts with life in a new country (Ward, 2001). Social support is an important protective factor in the development of depression in individuals with chronic illness (Connell, Davis, Gallant, & Sharpe, 1994). It would be expected that social support would play an even stronger role among Latinos who depend upon the family in times of need and are a traditionally collectivistic culture (U.S. Department of Health and Human Services, 2001; Smart & Smart, 1995; Triandis, 1994). Latinas with diabetes by virtue of being female and having diabetes are already at risk for developing depression since Griffith and Lustman (1997) concluded that women with diabetes are at a greater risk of developing depression than men with diabetes or women without diabetes. The role of the family in patients with diabetes has also been investigated (Fisher et al., 2000): They found that family organization had an effect on diabetes management in Latino patients, whereas family organization did not have an effect on European American patients.

The individual's adaptation to American life and/or culture has shown to be related to depression as well. *Acculturation* is the process of cognitive and behavioral change that a person undergoes when living in a multicultural society or coming in contact with a new culture due to immigration, colonization, or other important political changes (Marín, 1992). Differences in acculturation have been linked with psychiatric diagnoses, depression, alcoholism, and other health factors (Alderete, Vega, Kolody, & Aguilar-Gaxiola, 1999; Baezconde-Garbanati et al., 1999; Golding, Karno, & Rutter, 1990; Heilemann, Lee, & Kury, 2002; Vega et al., 1998). Research with Mexican Americans demonstrates that those who are born in the United States usually have more depressive symptoms and when diagnosed with clinical depression, their episodes are usually longer than Mexican Americans born in Mexico (Golding et al., 1990; Vega et al., 1998). In addition, Golding and Burnam (1990) found that U.S.-born Mexican Americans reported more depressive symptoms than immigrant Mexican Americans despite the fact that the Mexico-born participants had lower incomes and reported more stress and less social support. Higher levels of depressive symptoms were found in women of Mexican descent who had been born in the United States than in Mexico-born women (Golding, Karno, & Rutter, 1990; Sorenson, Rutter, & Aneshensel, 1991). Immigrant Latinas in California were found

to have lower rates of depression in comparison to U.S.-born Latinas and in comparison to African Americans and non-Latino Whites (Baezconde-Garbanati, 1999; Vega et al., 1998).

The Cultural Context and Diabetes Care

The traditional role and cultural norm for Latinas may be in conflict with medical care instructions given by a health care professional because in order to follow instructions, the Latina would be required to focus on her own needs (Adams, 2003). Latina mothers put themselves as last priority and often deny themselves necessary attention. One example of how this cultural belief affects the health of a diabetic Latina is that she views her need to buy foods appropriate for her diabetic diet as selfish, since no one else in the family may like or eat them, and continues to eat foods that increase glucose levels (Oomen, Owen, & Suggs, 1999). When the immigrant Latina has to contribute to the family's economic needs (in addition to being the homemaker), she is likely taking on roles/responsibilities for which she may not have been well prepared. This may add to the stress and duties the Latina already has living in the United States. However, it is notable that with the tradition of respect in Latino culture, the roles are reversed over time, and her children are expected to care for the Latina mother when she is older (Holmes & Holmes, 1995; Paz, 1993). Therefore, as the Latina woman ages, the burden of care for others decreases and her opportunity to focus on her own needs increases. This is a possible elucidation to why age is a factor, especially in Latinas, in metabolic control. For example, Bambauer and colleagues (2004) demonstrated that age was negatively associated with higher HBA1c levels in their study that focused on antidepressant adherence in patients with diabetes who take antidepressants. Furthermore, these researchers also concluded that being a minority was a strong predictor to having poorer glycemic control. Diehl, Bauer, and Sugarek (1987) showed that a sample of people with diabetes (predominately Mexican American) who were compliant to their diabetes regimen were slightly older than the non-compliers.

The purpose of this study was to assess the prevalence of depressive symptoms among Latinas with diabetes at an urban community clinic. This study adds to the existing literature by exploring intragroup differences of Latinas with diabetes in relation to depression and metabolic control and factors that might impact these areas. This study is unique in exploring areas for correlates of depressive symptoms and metabolic control in Latinas with diabetes. Cultural variables and social support are two areas that have not previously been investigated in a population of Latinas with diabetes. Based on the existing literature, we hypothesized that depressive symptoms would be associated with poorer metabolic control, and that higher levels of acculturation and lower levels of social support would be associated with higher levels of depressive symptoms. In addition, we proposed that increases in age for these Latinas would be associated with better disease management.

Method

Participants

The study was carried out in a publicly funded community clinic of the Parkland Health and Hospital System that serves the South-

west Dallas area. The typical patient in this clinic is a middle-aged immigrant Latina woman who often has a third-grade education and does not speak English. Requirements for participation were: female gender, self-identification as Latina, age between 18 and 65 years, diagnosis of type 2 diabetes; and free from diabetes-related major complications (amputations or blindness). Of the 109 Latinas who met inclusion criteria and agreed to participate, 96 participants completed the full interview.

Procedure

Potential participants were invited into the study during a routine clinic visit. All measures were administered in interview format because of the limited educational level of the typical clinic patient. The participants were given a choice as to whether they preferred English or Spanish for their interview. For those who did not wish to remain in the clinic for the interview, the option of completing the study by telephone was offered. Information obtained from the patient's chart included diagnoses of diabetes current and/or past depression diagnoses and history of depression, the most recent HbA_{1c} level within six months before the interview date and a phone number. If the participant indicated a high level of depressive symptoms, the interviewer made referrals accordingly to the social worker and psychologist at the clinic. In addition, a handout was given that listed resources for bilingual psychological services in the Dallas–Ft. Worth area.

Measures

Depression. The Center for Epidemiological Studies–Depression (CES-D) Scale is a 20-item scale designed to be used in community surveys to measure frequency of depressive symptoms in the general population (Radloff, 1977). Responses indicated how the respondent felt during the past week by a series of Likert (0–3 scale) questions: 0 = *Rarely or none of the time (less than one day)*; 1 = *Some or a little of the time (1–2) days*; 2 = *Occasionally or moderate amount of time (3–4) days*, and 3 = *Most of all of the time (5–7) days* (Bohannon, Maljanian, & Goethe, 2003). This measure has been validated in both English and Spanish. It has been widely used and is particularly valid for research with Latinos, particularly low-income minority women (Thomas, Jones, Scarinci, Mehan, & Brantley, 2001) and Mexican nationals (Masten, Caldwell-Colbert, Alcalá, & Mijares, 1986). Reliability has been demonstrated for the CES-D for people with a chronic illness (Devins, Orme, & Costello, 1988), for people of Mexican descent in English and Spanish (Roberts, 1980), and for Mexican immigrant women (Vega, Kolody, Valle, & Hough, 1986). Shafer (2006) compared the CES-D and other measures of depression in a meta-analysis and concluded that the CES-D had relatively little variability across factors analyses (included in his meta-analysis) compared to the other depression measures. These factor analyses were consistent with Radloff's (1977) original factor analyses (Shafer, 2006). Investigators have suggested using a cutpoint of 19 for patients with a chronic health condition (Martens et al., 2003), 20 for Latino outpatients (Bohannon et al., 2003), or 24 for Mexican immigrant women (Vega et al., 1986). For the current study, scores on the measure were evaluated both as a continuous variable and a categorical variable with “depressed” defined by Vega et al.'s conservative cutpoint of 24. In

addition, in this study, participants responded whether they had ever been diagnosed with depression by a medical professional, and the participant's medical chart was reviewed for diagnosis.

Control of diabetes. Metabolic control was obtained with a recent (within 6 months before interview date) glycosylated hemoglobin (HbA_{1c}) level from the patient's chart. Analyses were conducted on this measure both as a continuous variable and as a categorical variable reflecting adequate and poor control. The value for “adequately controlled” diabetes was specified as HbA_{1c} < 7% and for “poorly controlled” diabetes as HbA_{1c} ≥ 7% as suggested by the National Diabetes Education Program (2005). However, only 81 of these 96 women had a documented HbA_{1c} level within 6 months of the interview either because they did not appear for the requested labwork or the physician failed to order one if the patient presented with symptoms in another area (i.e., flu symptoms, gynecological issues, etc.).

Acculturation. Acculturation was measured by using the Bidimensional Acculturation Scale for Hispanics (BAS, Marín & Gamba, 1996). This measure is based on a two-dimensional framework (Hispanic/Latino and non-Hispanic/Latino) of the acculturation process and are independent of each other, giving two scores. The instrument has 24 items divided into three subscales: Language Use, Linguistic Proficiency, and Electronic Media. Each subscale contains items with half of them pertaining to the Latino domain and the other half pertaining to the non-Latino domain. The cutoff to define “high” versus “low” on each domain is 2.5, as suggested by the authors of the scale (Marín & Gamba, 1996). In the current study, we used definitions and modifications of labels of Berry and Sam's (1997) modes of acculturation. A score above 2.5 on the Latino domain and a score below 2.5 on the non-Latino domain was the Traditional (“Separated”; Berry & Sam, 1997) acculturation category. A score above 2.5 on the non-Latino domain and a score below 2.5 on the Latino domain was the Assimilated acculturation category. A score above 2.5 on both domains was the Bicultural (“Integration”; Berry & Sam, 1997) acculturation category and a score below 2.5 on both domains was the Marginalized category. Marín & Gamba (1996) tested the validity and reliability of this instrument with a community sample of varying educational levels. In addition, participants answered a demographic question about years living in the United States.

Perceived Social Support was measured by the Interpersonal Support Evaluation List–Short Form (ISEL-SF) adaptation by (Pierce, Frone, Russell, & Cooper, 1996) This 15-item measure (Pierce et al., 1996) is a shortened version of the 40-item Interpersonal Support Evaluation List (Cohen, Mermelstein, Kamarck, & Hoberman, 1985). Pierce and colleagues (1996) modified the instrument to accommodate low education levels and used factor analyses to choose the five best indicators for each subscale. An overall score was used in addition to scores on the three subscales: Tangible Support, Appraisal Support, and Belonging Support. A professional translator of Mexican heritage who trained at the Language Academy for the Mexican Foreign Service and the U.S.–Mexico Institute for Cultural Relations, translated the instrument. Back translation was not used. The translation of the instrument was reviewed by a bilingual psychologist, who altered some terms to ensure that they would be more easily understood by patients with limited

education. The final product was reviewed by the bilingual members of the team, who agreed that the scale had been adequately translated and was likely to be easily understood.

Results

Sample Characteristics

Table 1 displays demographic data for study participants. Seventy-eight percent ($n = 75$) chose to take the interview in Spanish, with the remainder choosing English. Most participants completed the interview in person (87%, $n = 84$), 12% ($n = 11$) completed the interview over the phone, and one person began the interview in person and completed it over the phone.

Sample characteristics with means and standard deviations are presented in Table 2 for depression, acculturation, and social support variables. There was a high rate of depressive symptoms in Latinas with diabetes at the urban community clinic, with almost a third falling at or above the cutpoint of CES-D equal to 24 in the study.

We used Pearson correlations to determine the strength of the relationships between depression and metabolic control, depression and social support, depression and acculturation, and metabolic control and demographic variables. In addition, comparisons between the two control groups (e.g., adequate and poor) were performed with t tests of the dependent variables, as well as for the two depression groups (Depressed and Nondepressed).

Correlates of Depression

Several variables were significantly related to depression (Table 3.) Social support, metabolic control, and time with diabetes were significantly associated with depression. The social support scale highly correlated with depression. Comparison between the correlation coefficients were significant, based on the Fisher's r to z conversion for the Tangible Support subscale and the Belonging Support subscale ($z = -2.40$; $p < .05$), while other comparisons

Table 1
Demographic Data for All Participants

Demographic variable	Range/n	%	<i>M</i>	<i>SD</i>
Age	26–65		51.82	8.73
Years living in United States	2–65		26.93	18.22
Country of birth				
Mexico	66	68.8		
United States	23	24		
Other	7	7.2		
Immigrated to United States	74	77.1		
Generation				
First	74	77.1		
Second	6	6.3		
Third	4	4.2		
Fourth	5	5.2		
Fifth	6	6.3		
Years of education	0–16		6.54	3.9
Yearly household income	\$0–\$40,000		\$12,957	\$7,385
Household size	1–10		3.55	2.07
Years living with diabetes	0.1–25		7.64	6.30
Diagnosed with depression by a medical professional	36	37.5		

Table 2
Sample Characteristics for Major Variables

Variable	Range/n	%	<i>M</i>	<i>SD</i>
CES-D score ^a	0–57		16.71	13.82
Depressed ^b	31	32.3		
BAS ^c Score				
Hispanic domain	1.5–4.0		3.28	0.46
Non-Hispanic domain	1.0–3.92		1.93	0.88
Cultural groups ^d				
Traditional	66	68.8		
Bicultural	25	26.0		
Assimilated	5	5.2		
ISEL-SF ^e	21–60		48.25	9.84
Tangible Support ^f	5–20		17.17	3.66
Appraisal Support ^f	5–20		15.44	4.35
Belonging Support ^f	7–20		15.56	4.32

^a Center for Epidemiological Studies-Depression Scale, Theoretical range (0–60). ^b Based on CES-D cutoff score of 24. ^c Bidimensional Acculturation Scale for Hispanics, Theoretical range (0.0–4.0). ^d Based on BAS cutoffs of 2.5. ^e Interpersonal Support Evaluation List – Short Form, Theoretical range (0–60). ^f Subscale of ISEL-SF.

among the subscales proved to be nonsignificant. Metabolic control was significantly correlated with depression for those individuals who had a recent HbA_{1c} level recorded in the chart ($n = 81$). Years of living with diabetes was found to be significantly correlated with depression. Scores on the BAS did not relate significantly with indices of depression for this sample. Table 4 demonstrates a comparison between the depressed and nondepressed groups on several variables.

Correlates of Metabolic Control

Age and HbA_{1c} were negatively correlated ($r[n = 81] = -0.22$; $p = .03$). This relationship persisted after controlling for duration of diabetes in a linear regression ($\beta = -0.27$; $p < .05$). The relationship between poor versus adequate metabolic control (categorical variable), and demographic and disease-related variables, depression, and social support are presented in Table 5. Duration of diabetes was associated with metabolic control, with those with longer duration of disease showing worse control. The possibility of social support interacting with the results of depression and metabolic control was tested; a χ^2 test was run, but the results did not suggest moderation of depression's effect on control by social support. A linear regression for HbA_{1c} levels indicated that depression and support are independent influences on control of diabetes, and there was no interaction between these two variables in regards to HbA_{1c}.

Discussion

Overall Findings

Latinas who have poor control over their disease are more likely to be depressed. Comparisons between the adequate control and poor control groups indicated that a significant difference emerged in years of living with diabetes, with those participants who had poor control more likely to have had diabetes longer. In addition, length of time living with diabetes was also significantly positively associated with depression. Depression was found to be strongly

Table 3
Matrix of Correlations Among Study Variables

Variable	CES-D	Age	Years living with diabetes	Years living in United States	BAS-H	BAS-NH	HBA _{1c} ^a	ISEL-SF	Tangible Support ^b	Appraisal Support ^b
Age	0.01	—								
Years living with diabetes	0.26**	0.23*	—							
Years living in United States	0.01	0.32**	0.05	—						
BAS-H ^b	0.06	-0.13	-0.07	-0.26*	—					
BAS-NH ^c	0.08	-0.01	0.02	0.75**	-0.31**	—				
HBA _{1c} ^d	0.21*	-0.22*	0.15	-0.16	0.16	-0.04	—			
ISEL-SF ^e	-0.63**	-0.03	-0.10	0.11	<0.01	0.12	0.01	—		
Tangible Support ^f	-0.35**	-0.10	-0.02	-0.04	-0.04	0.10	0.14	0.74**	—	
Appraisal Support ^f	-0.54**	<0.01	-0.12	0.06	0.06	0.01	-0.05	0.82**	0.37**	—
Belonging Support ^f	-0.61**	<0.01	-0.11	0.21*	-0.01	0.19	-0.04	0.84**	0.48**	0.56**

Note. CES-D = Center for Epidemiological Studies–Depression Scale; BAS-H = Bidimensional Acculturation Scale for Hispanics–Hispanic domain; BAS-NH = Bidimensional Acculturation Scale for Hispanics–Non-Hispanic domain; ISEL-SF = Interpersonal Support Evaluation List–Short Form.

^a Subgroup of 81 with current HBA_{1c}. ^b Subscale of ISEL-SF. ^c Bidimensional Acculturation Scale for Hispanics–Non-Hispanic domain. ^d Subgroup of 81 with current HBA_{1c}. ^e Interpersonal Support Evaluation List–Short Form. ^f Subscale of ISEL-SF.

* $p < .05$. ** $p < .01$.

correlated with social support. Those participants who had lower scores on the social support measure were more likely to be depressed, thus supporting another hypothesis. Our fourth hypothesis was confirmed since the older Latinas were more likely to have lower HBA_{1c}, thus demonstrating better control of their diabetes.

Almost a third of the participants had scores indicating possible depression based on the cutpoint score of 24, and over 37.5% indicated they had been diagnosed with depression, while 16.7% had been diagnosed with depression and fell above the cutpoint at the time of the study. This finding is consistent with previous reports (Heilemann et al., 2002) of depressive rates among Latinas. We failed to provide support for the

hypothesis that Latina women with diabetes who are more acculturated to the United States will more likely have depression. It is notable that on qualitative questioning, many of the women indicated that their depressive symptoms were due to an “empty nest” feeling or due to their life in the United States as characterized by loneliness, isolation, feeling foreign, and so forth. For example some said that their children did not care for them like they would if they were in Mexico, “Everyone here (U.S.) shuts their doors,” “Everyone has their own problems.” No significant results regarding acculturation were demonstrated using a direct measure of this construct. This finding may be the result of a narrow range of acculturation present among the attendees of this clinic, with few highly acculturated Latinas in the group.

Table 4
Means and Standard Deviations of Variables in Depressed and Non-Depressed Groups

Variable	Non-depressed ($n = 65$; $n = 53^a$)		Depressed ($n = 31$; $n = 28^a$)	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Age	52.26	8.98	50.90	8.24
Years living with diabetes*	6.67	5.87	9.70	6.76
Years in United States	26.55	18.71	27.71	17.42
BAS				
Hispanic domain	3.25	0.46	3.33	0.46
Non-Hispanic domain	1.86	0.88	2.07	0.87
ISEL-SF**	51.94	7.67	40.52	9.47
Tangible Support ^{b**}	17.92	3.00	15.58	4.40
Appraisal Support ^{b**}	16.77	3.56	12.65	4.58
Belonging Support ^{b**}	17.18	3.48	12.16	3.96
HBA _{1c} ^a	7.94	2.30	9.06	2.15

Note. BAS = Bidimensional Acculturation Scale for Hispanics; ISEL-SF = Interpersonal Support Evaluation List–Short Form.

^a Based on a subgroup of 81 with current HBA_{1c}. ^b Subscale of ISEL-SF. * $p < .05$. ** $p < .01$.

Depression and Social Support

The relationship between CES-D score and ISEL-SF score was especially strong in this study. This demonstrates the importance of social networks in preventing a decline in mental health of Latinas. It seems that the physical presence of others or having the availability of a social network (Belonging Support) is more crucial than instrumental help such as having someone drive them to the doctor (Tangible Support) to preventing possible depression in Latinas with diabetes.

Metabolic Control

Consistent with findings from other groups (Anderson et al., 2001; Culpepper, 2002; Ludman et al., 2004; Lustman et al., 2000), there was a positive relationship between diabetes and depressive symptoms since poorer control (higher HBA_{1c}) was indicative of more depressive symptoms, and a longer duration of disease was associated with worse control. It would be expected that unrelenting multifaceted demands from the medical regimen cumulate toward depression. However, there may also be contribution from increased medical complications that accompany progression of the disease.

Table 5
Means and Standard Deviations of Demographics and Study Variables in Adequate and Poor Control Groups

Variable	Adequate Control ^a (n = 26)		Poor Control ^b (n = 55)	
	M	SD	M	SD
Age	53.08	9.20	50.85	9.15
Years living with diabetes ^{**}	4.28	4.33	8.60	6.87
Years in United States	27.88	21.86	26.09	16.69
BAS				
Hispanic domain	3.16	0.48	3.32	0.40
Non-Hispanic domain	1.86	0.95	1.98	0.88
ISEL-SF	47.38	9.26	48.87	10.38
Tangible Support ^c	16.58	4.21	17.45	3.48
Appraisal Support ^c	15.77	4.41	15.51	4.31
Belonging Support ^c	15.04	4.29	15.84	4.53
CES-D	13.77	11.23	18.76	14.88

Note. BAS = Bidimensional Acculturation Scale for Hispanics; ISEL-SF = Interpersonal Support Evaluation List–Short Form; CES-D = Center for Epidemiological Studies–Depression Scale.

^a HBA_{1c} < 7.0. ^b HBA_{1c} ≥ 7.0. ^c Subscale of ISEL-SF.

** $p < .01$.

The relationship between age and metabolic control is a noteworthy finding because age has not been previously hypothesized to be a strong predictor in metabolic control in Latinas. As the Latina gets older and the children become more independent, she has more freedom to focus on independent goals such as personal health that requires lifestyle modification. However, we also acknowledge that the relationship between age and better control of diabetes may be an artifact of the fact that those with poor control may have higher mortality rates and may not survive as many years.

Clinical Implications

More attention should be focused on Latinas with diabetes because this sector of the population is rapidly increasing. In addition, depression could be prevented in these women if caught in the early stages by a screening instrument. The link between metabolic control and depression emphasizes the importance of early cost-effective interventions that may prevent the vicious bidirectional cycle of depression and diabetes complications (Black, 1999; Black et al., 2003; Culpepper, 2002; Lustman et al., 2000). Our findings suggest the need for developing culturally acceptable methods to promote diabetes regimen adherence in younger Latinas. The strong link of social support with depression could be a major area of intervention to help improve mental health for Latinas with diabetes. Based on our findings and other findings, metabolic control was associated with depression. However, whether a reduction in depressive symptoms is associated with improved metabolic control is not yet known.

Although not a key issue of investigation in this study, it is notable that measures of metabolic control were not obtained for these women on a routine basis. It is unclear whether the missing information would hinder collaborative provider-patient progress toward an optimal metabolic control. Also, it is important to provide culturally relevant information to the Latina with diabetes about depression. A form of group therapy or educational classes

may provide support for the Latina who may not have much social support outside her clinic. A similar intervention was demonstrated to be beneficial in a study by Gross et al. (2005). The authors demonstrated that a series of psychoeducational sessions targeting Latino patients with low literacy levels proved to be significant in improving glucose levels.

Limitations of the Study

The study was conducted with translated instruments, one of which (ISEL-SF) has not been validated in this population. Validity and reliability for the adaptation and translation of the ISEL-SF has not been performed on a Latino group. However, wording of the items was changed to accommodate low education levels (Pierce et al., 1996). Back translation was not used for instruments translated for this study. All data were collected from a single clinic, and findings may not be generalizable. Clinical interviews were not administered to obtain accurate measures of clinical depression. This is presented as a preliminary, cross-sectional study with focus on a population in dire need of more research. It contributes to the literature in exploring intragroup differences among economically disadvantaged Latina women with type II diabetes utilizing a public health clinic. Findings from this study expand on the various areas diabetes affects Latinas' lives. However, it does not provide information about the temporal relationship between mood difficulties, social support changes and metabolic control. It is not clear whether these findings hold for all women or all types of patients with diabetes in general.

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