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Social Control in Older Adults' Diabetes Self Management and Well-being

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Abstract

Objectives—The "dual effects" hypothesis argues that social control can be effective in promoting positive health-related behavior change, but it can also jeopardize the targeted individual's well-being. This hypothesis is tested using hemoglobin A1C as an objective indicator of behavioral compliance with diabetes self-management behavior and depressive symptoms. Differences in the effects of social control on A1C and depressive symptoms by gender and ethnicity are tested.

Methods—Cross-sectional data were obtained from a multi-ethnic sample of older adults with diabetes (N=593).

Results—Greater social control was associated with *poorer* rather than *better* odds of achieving glucose control, and with greater depressive symptoms. There was no evidence that social control has differential effects on either glucose control or depressive symptoms by gender or ethnicity.

Discussion—Active use of social control attempts by family members and friends, especially if they are coercive or punitive in nature, are likely counterproductive for maintaining the physical and mental health of older adults with diabetes.

Keywords

social control; diabetes management; ethnicity; depressive symptoms

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Introduction

Social gerontology has a strong and vibrant history of research demonstrating the contributions of social processes to health outcomes in later life. In contrast to the rich social support and social engagement literatures, social control has received comparatively little research attention.[1,2] Social control is a regulatory function of social relationships wherein social network members promote compliance with social norms and expectations through the use of direct or indirect social sanctions.[2] The stereotypical image of a wife threatening to leave her husband if he does not stop drinking illustrates one type of social control. Attempts by older adults' spouses, children or grandchildren to influence the adoption of positive lifestyle habits (e.g., regular exercise), the discontinuation of negative habits (e.g., quit smoking) or adherence to chronic disease management strategies all represent concrete targets of social control in the domain of health.[3,4]

Social control has been posited to have dual effects on the health of the targeted individual.[5] Hughes and Gove suggested that social control may be a viable strategy for initiating and maintaining health behavior changes beneficial to physical health (e.g., quitting smoking, participating in regular exercise), but that such changes can be accompanied by compromised psychological well-being. The theoretical explanation for the dual effect is that social control attempts can promote frustration and undermine the targeted individual's sense of autonomy and broader indicators of subjective well-being. The potentially deleterious psychological effects of social control may be especially pronounced when sanctions are punitive in nature such as the use of guilt or humiliation to "motivate" behavior change.[6,7]

Research linking social control to physical and psychological well-being outcomes among older adults is sparse. Older adults report fewer people who have attempted to influence their behavior, and less frequent attempts at social control than midlife or younger adults, despite having greater health problems that equire healthful lifestyles.[8] Evidence for the dual effects hypothesis among older adults is mixed. Consistent with the dual effects hypothesis, Krause and colleagues[9] found that a measure of social control (social sanctions) was associated with more frequent exercise and greater depressed affect among older Japanese adults. By contrast, Rook and colleagues[10] found in a sample of predominantly white older adults that social control was generally unassociated with health practices, and that social control was associated with better psychological function. Lewis and Rook[6] found support for the dual effects hypothesis in a sample of predominantly white adults aged 45–54. The mixed findings suggest the dual effects model of social control may have differential salience for different demographic or sociocultural groups.[2]

The goal of this study was to determine if social control produces dual effects among rural dwelling older adults with diabetes. Diabetes is a chronic condition that requires adherence to a complex behavioral regimen including taking oral medication (or insulin), glucose monitoring, exercising, and following a diet emphasizing vegetable consumption and reduction of simple carbohydrates.[11] Regimen adherence is essential for maintaining good glucose control and minimizing the risk of debilitating consequences such as blindness, neuropathy, amputation, and cardiovascular disease.[12,13]

Social control theory has been applied to diabetes self-management in three previous studies. In a study of younger adults with Type 1 diabetes, Thorpe and colleagues[14] reported that social control was unrelated to effective glucose control, and that punitive approaches to social control resulted in counterproductive behavior (e.g., greater pretending, less change) and poor psychological adjustment. More recent research[15,16] reported that negative forms of social control had a null association with[15] or a deleterious association with dietary behavior, while positive forms of social control was associated with better adherence to dietary recommendations. August and Sorkin[15] also documented that men with diabetes are targets of social control more frequently than women, and that the effects of social control on both affective and behavioral outcomes differs by gender. Building on this foundation and the broader social control literature, the current study uses data from a multi-ethnic sample of rural-dwelling older adults to evaluate the dual effects hypothesis, and determine whether the dual effects model differs by gender or ethnicity. The focus on possible ethnic differences in the effects of social control is motivated by documented differences in older minority adults' social networks[17–19] and the potential for social control, as well as potential cultural differences in the meaning of social control in interpersonal relations. Specifically we test four hypotheses:

H1 Greater social control is associated with glucose control, as measured by having an A1C level < 7%.

H2 Greater social control is associated with greater depressive symptoms

H3 The association of social control with glucose control and depressive symptoms differs for women and men.

H4 The association of social control with glucose control and depressive symptoms varies by ethnicity

Method

Sample

A sample (N = 593) of African American, American Indian, and white men and women 60 years or older who had had a diabetes diagnosis for at least two years and were not receiving dialysis treatment were recruited from 8 south central counties in North Carolina. The goal of the sampling plan was to recruit 100 participants for each of the six ethnic-by-gender cells, with each cell having participants spread across educational attainment categories. The study counties were chosen because they contain large minority populations and because a high proportion of the population is below the federal poverty line. They represent variation on the urban-rural continuum (http://www.ers.usda.gov/Data/RuralUrbanContinuumCodes/2003/), such that one is in a metropolitan area with an urban population of 2,500–19,999, one is a nonmetropolitan county with urban population of 20,000 or more, and one is a nonmetropolitan county with urban population of 2,500–19,999.

A recruitment strategy combining three tactics was used to provide a representative sample from the study communities. A site-based sampling strategy[20] was used, whereby individuals were recruited from organizations and locations across the study counties. The number of participants from each "site" or recruitment location included: 50 from community-based organizations (veteran, civic groups etc.), 39 from community events, 43 from churches, 11 from flyer postings, 92 from senior housing, 65 from senior centers, and 104 from congregate meal sites. Study staff members have spent time in these sites over the past 12 years as part of ongoing mixed methods research projects.[21,22] Formal and informal community leaders were enlisted to help with study recruitment. Recruitment also included 165 participants from individual community members through word-of-mouth referral, and 24 participants from an existing participant database compiled from previous rural aging studies that also used a site-based sampling procedure for participant recruitment.

Data Collection

Data collection was completed from June, 2009, through February, 2010. Prior to collecting data, trained study staff explained the study goals and activities to participants, answered questions as necessary and obtained signed informed consent. Participants completed an interviewer-administered, fixed response questionnaire and a fingerstick blood draw for Hemoglobin A1C test. Data collection was conducted at the home of the participant, unless they requested to meet elsewhere. An incentive ($10) was offered for completing the interview. The Wake Forest School of Medicine Institutional Review Board (FWA #00001435) approved all sampling, recruitment and data collection procedures.

Measures

Social control was measured using items developed by Lewis and Rook[6] asking how frequently someone urged the participant to change discrete health behaviors. Given our focus on diabetes self-management, we operationalized social control using questions about five behaviors relevant to glucose control. Specifically, participants were asked "how often does someone you know urge you to…", "… exercise more often," "…lose weight," "…eat a healthier diet," "…use less salt," and "…eat less fat." Response options ranged from "never" (1) to "very often" (5). Items were summed with higher values indicating greater social control ($\alpha = 0.83$).

Glycemic control (A1C) was assessed by collecting a finger stick blood sample and using the procedures for the handheld Bayer A1c Now+ machine.[23] Results were available in 5 minutes and were given to the respondent after all questionnaire data had been collected. Individuals with A1C values less than or equal to 7% were classified as being "in control", whereas those with A1C values greater than 7% were classified as being "out of control".

Depressive symptoms was measured using a dichotomous version of the Center for Epidemiological Studies Depression Scale (CES-D).[24] The dichotomous version of the CES-D assesses the occurrence of depressive symptoms during the previous week using 20 items rated either "yes"(1) or "no" (0). Items were scored such that higher values indicates more depressive symptoms, and summed ($\alpha = 0.81$) with possible scores range from 0 to 20.[25]

Personal characteristics included in this analysis were ethnicity (White, African American, and American Indian), age (in years), gender (female coded 1, male coded zero), marital status (currently married versus not), educational attainment (less then high school, high school or equivalent, and greater than high school), poverty status, and duration of diabetes which was dichotomized (< 10 years, > 10 years) to differentiate individuals that have been managing the condition for several years from those less experience.

Analyses

All analyses were performed using SAS v9.2 (SAS Institute, Cary, NC). Descriptive statistics of participant characteristics were calculated. Preliminary bivariate analyses examining the association of social control with glucose control and depressive symptoms were assessed using Pearson correlation coefficients. The hypotheses were tested using multivariate regression models. Glucose control, a binary outcome, was modeled using a logistic regression model, whereas depressive symptoms were modeled by fitting an ordinary least-squares regression. Modifying effects of gender and ethnicity were evaluated using standard techniques involving inclusion of multiplicative interaction terms (Social Control*Gender, Social Control*African American, Social Control*American Indian) in the specified regression models.[26] Type I error rate was fixed at 0.05.

Results

The ethnic composition of the sample was approximately balanced, because of the study design required by the parent project: approximately one-third of the sample was African

American, 30% of the sample was American Indian, and the remainder of the sample was White (Table 1). Over half of the sample (51.6%) was aged 60 to 69 years, 37.6% were aged 70 to 79, and the remainder was over 80 years. Over half of the sample (61.8%) was female. About one-third of participants reported having less than a high school education, while another one-third reported graduating from high school with no further formal education, and the remainder reported having some formal education beyond high school. Many participants (29.8%) reported household earnings below federal poverty thresholds for the household size, and less than half of the participants (46%) were currently married.

Sample characteristics differed by gender and ethnicity. Women were less likely than men to be currently married ($p < 0.0001$), and more likely than men to be living in poverty ($p < 0.0001$). White participants were generally older than American Indian participants ($p < 0.05$). African Americans were less likely than Whites ($p < 0.01$) to be currently married, and both African Americans and American Indians had lower levels of education than whites ($p < 0.05$ and p < 0.001 for African Americans and American Indian's respectively).

Participants' average social control score was 11.7 (SD = 4.9), which was below the midpoint of the possible distribution of scores (Table 2). The average participant endorsed experiencing 7 depressive symptoms in the past week (SD=3.2), and half the sample had an A1C value of less than 7% indicating good glucose control. Bivariate correlations indicated that greater social control was associated with more depressive symptoms ($r = 0.25$, $p < 0.001$) and poorer likelihood of having good glucose control ($r = -0.11$, $p < 0.01$).

Results from multivariate models contradict the study hypotheses focused on glucose control (Table 3). In contrast to hypothesis 1, greater social control was associated with *poorer* rather than *better* glucose control. For every unit increase in social control, the odds of having an A1C value of less than 7% decreased by 5% (95% CI = 0.92 – 0.99). Additional analyses provided no evidence that the association of social control with A1C differed by gender or ethnicity; thus, the elements of hypotheses 3 and 4 focused on glucose control were not supported.

Consistent with hypothesis 2, greater social control was associated with more depressive symptoms ($b = 0.28$, $p < 0.01$), beyond the independent effects observed for several demographic characteristics that are strongly associated with depressive symptoms, particularly, marital status, and poverty status. There was no evidence that the association of social control with depressive symptoms differed by either gender or ethnicity. Consequently, elements of hypotheses 3 and 4 focused on depressive symptoms were not supported.

Discussion

Social control is widely used in health and health behavior change, yet compared to other social processes like social support, social control has received little empirical attention.[1,2] Previous research suggests that social control may be useful in bringing about some positive health outcomes, but it can be at the expense of psychological well-being.[6,9,14] However, evidence for the dual-effects model of social control has been mixed, raising the possibility that the putative effects of social control on health and well-being outcomes may vary for different groups of individuals. Consequently, this study used data from a multi-ethnic sample of older adults with diabetes to explore associations of social control with glucose control and depressive symptoms, and possible variation in these associations by gender and ethnicity.

Results of multivariate models suggest no evidence that social control is useful in promoting better diabetes self-management. In fact, our evidence suggests that attempts to influence older adults' exercise and eating behavior is actually associated with lower odds of having an A1C reading of less than 7%. Although contradictory of our hypothesis, these results complement previous research showing that negative or punitive approaches to social control resulted in counterproductive glucose control behavior[14] including poorer dietary behavior among older adults with diabetes.[15,16] The neutral phrasing of our social control measure (i.e., how often did someone you know *urge you* to…") does not allow differentiation of positive (e.g., persuasion) from negative (i.e., pressure) social control techniques; nevertheless, our results contribute to the literature by linking social control with an objective indicator of glucose control. Additional research is needed to delineate whether positive and negative forms of social control have differential effects on glucose control. In the meantime, our results combined with those from previous research suggests that social control attempts by family and friends to promote better adherence to advocated behaviors for controlling blood glucose may have potentially negative consequences.

We observed a robust inverse relationship suggesting that being the target of more social control was associated with greater depressive symptoms. These results are consistent with previous research[6,9] and the secondary component of the dual-effects hypothesis that greater social control compromises psychological well-being. Although we are not able to test the mechanisms by which social control contributed to greater depressive symptoms, we presume that being the target of social control produces frustration and threats to personal autonomy.[5] Interestingly, the association observed between social control and depressive symptoms emerged despite using questions that did not explicitly tap either positive or negative forms of social control. Recent research highlights potentially deleterious effects of negative or punitive forms of social control.[14,16] The association observed in this study suggests one of two possibilities: the first is that older adults may respond differently to social control than younger adults, and the second is that older adults may recall negative experiences of social control when presented with questions about general social control (i.e., neither positive or negative control strategies). Each of these possibilities is worthy of additional research.

We found no evidence that the effects of social control on either glucose control or depressive symptoms differed by gender or ethnicity. The lack of gender differences in the effects of social control on either glucose control or depressive symptoms is partially consistent with previous research indicating social control has comparable effects on dietary behavior for women and men.[15] However, August and Sorkin did report that married men reported greater appreciation of social control efforts than married and unmarried women as well as unmarried men. Recognizing that older men are more likely than older women to be married, and that spouses are the most likely social network members to attempt social control,[4,15] additional research with larger sample sizes is needed to definitively test for gender differences in the effects of social control on effective glucose control. We could locate no previous research examining ethnic variation in the effects of social control with glucose control or depressive symptoms. Our results indicating no difference in the associations of social control with glucose control and depressive symptoms by ethnicity contribute to the literature by suggesting that social control has comparable effects on older adults, regardless of cultural context.

This study offers several contributions to the social control literature. First, it is one of the first studies to use an objective indicator of health.[14] Our use of A1C as an assessment of participants' adherence to advocated diabetes self-management practices minimizes problems associated with common method variance and subsequent Type II error. That results are based on a large multi-ethnic sample is another contribution because it helps ensure that study results are applicable to broader segments of society. Of course, the contributions of this study must be interpreted in light of its limitations. It is possible that a history of poor glucose control may have stimulated greater social control attempts by family members, and the observed inverse association. The inability of our measure social control to differentiate positive or benign forms of social control from those that are negative is another limitation. Future research should explore the potential differential effects of positive forms of social control such as persuasion and encouragement versus punitive or negative forms of social control like coercion or criticism. A final limitation is the geographic region of the sample: although there is little reason to anticipate that our study counties are substantially different from other rural areas in the southeast, it is unknown whether our results can be generalized to other regions.

Limitations notwithstanding, this study makes several contributions to the literature. Our results indicate that greater social control is associated with poor glucose control and greater depressive symptoms in an ethnically diverse sample of older adults with diabetes. These results are partially consistent with the “dual effects” hypothesis of social control theory. In contrast to the theory, greater social control was associated with poor glucose control suggesting that social control is not a useful strategy for promoting diabetes self-management behaviors. Consistent with dual effects hypothesis of social control, however, greater social control was associated with greater depressive symptoms. Collectively, the results suggest that family members’ or friends’ use of social control strategies to promote better diabetes self-management behavior by a targeted individual may backfire resulting in poorer glucose control while also contributing to elevated depressive symptoms.

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Table 1

Sample characteristics by gender and ethnicity (White, African American (AA), and American Indian (AI))

			Gender				Ethnicity					
			Women		Men		White		AA		AI	
	n	%	n	%	N	%	n	%	n	%	n	%
Ethnicity												
White	212	35.75	123	33.61	89	39.21						
African American	200	33.73	114	31.15	86	37.89						
American Indian	181	30.52	129	35.25	52	22.91						
Sex												
Female	366	61.72					123	58.02	114	57.00	129	71.27
Male	227	38.28					89	41.98	86	43.00	52	28.73
Age, years												
60–69	307	51.77	192	52.46	115	50.66	109	51.42	93	46.5	105	58.01
70–79	222	37.44	132	36.07	90	39.65	70	33.02	90	45	62	34.25
80+	64	10.79	42	11.48	22	9.69	33	15.57	17	8.5	14	7.73
Marital Status												
Currently married	272	45.87	130	35.52	142	62.56	113	53.3	78	39	81	44.75
Currently not married	321	54.13	236	64.48	85	37.44	99	46.7	122	61	100	55.25
Education												
<High school	217	36.66	123	33.7	94	41.41	62	29.25	76	38.19	79	43.65
High school graduate	200	33.78	137	37.53	63	27.75	73	34.43	66	33.17	61	33.7
>High school	175	29.56	105	28.77	70	30.84	77	36.32	57	28.64	41	22.65
Poverty												
At or above poverty line	407	70.05	225	62.67	182	81.98	158	75.24	125	65.1	124	69.27
Below poverty line	174	29.95	134	37.33	40	18.02	52	24.76	67	34.9	55	30.73
Duration of Diabetes												
< 10 years	227	40.11	146	42.07	81	36.99	82	41.21	72	37.89	73	41.24
≥ 10 years	339	59.89	201	57.93	138	63.01	117	58.79	118	62.11	104	58.76
A1C, %												
<7	302	50.93	193	52.73	109	48.02	107	50.47	102	51	93	51.38
≥7, <8	158	26.64	95	25.96	63	27.75	67	31.6	50	25	41	22.65

			Gender				Ethnicity					
			Women		Men		White		AA		AI	
	n	%	n	%	N	%	n	%	n	%	n	%
≥8	133	22.43	78	21.31	55	24.23	38	17.92	48	24	47	25.97

Table 2

Descriptive statistics and correlations for social control, depressive symptoms, and glucose control (N=593).

	M	SD	Range	SC	DS	A1C
Social Control (SC)	11.66	4.90	5 – 25	1.00		
Depressive Symptoms (DS)	6.91	3.24	0 – 20	0.25***	1.00	
Glucose Control† (A1C)	0.51	0.50	0 – 1	−0.11**	−0.04	1.00

†Glucose Control dummy variable coded 1 if A1C value is < 7, zero otherwise.

** $p < 0.01$

*** $p < 0.001$ (two-tailed)

Table 3

Models of glucose control and depressive symptoms

	Glucose Control b (SE)	Depressive Symptoms b (SE)
Social Control	−0.05 (0.02)**	0.18 (0.03)***
Gender		
Men	Reference	Reference
Women	0.02 (0.10)	−0.04 (0.31)
Ethnicity		
White	Reference	Reference
African American (AA)	−0.01 (0.13)	−1.17 (0.35)***
American Indian (AI)	0.01 (0.13)	−0.84 (0.35)*
Covariates		
Age (continuous)	−0.07 (0.13)	−0.38 (0.22)
Marital Status (unmarried=1)	0.07 (0.10)	1.27 (0.30)***
Education		
<High school	−0.08 (0.13)	0.62 (0.37)
High school graduate	−0.01 (0.12)	0.40 (0.36)
>High school	Reference	Reference
Years with Diabetes		
< 10 years	0.36 (0.09)***	−0.96 (0.29)**
≥ 10 years	Reference	Reference
Poverty (above poverty=1)	−0.09 (0.11)	−1.13 (0.34)***
Controlled A1C		−0.14 (0.29)

* $p < 0.05$

** $p < 0.01$

*** $p < 0.001$ (two-tailed)