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The Relationship between perceived social support from family and diabetes control among patients with diabetes type 1 and type 2

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Abstract

Background: perceived social support has a key role in diabetes control. It seems that diabetes control has been related to adoption of self-management behaviors which can be supported by family. The aim of this study was to assess relation between perceived social support from family and diabetes control among type 1 and 2 diabetic patients.

Methods: A cross-sectional study was performed in teaching hospitals affiliated to Tehran University of Medical Sciences during 6 months from May to October 2011. Study sample was 430 (113 type 1 and 317 type 2) diabetic patients who met the inclusion criteria through convenience sampling method. Patient's perceived social support from family was measured by Perceived Social Support from Family scale. Collected data was analyzed by using SPSS software version 11.5. Descriptive statistics were used for all variables. Non-parametric test (Mann-Whitney U and Kruskal-Wallis) was also used if variables had non-normal distributions.

Results: The Mean ± SD score for perceived social support were 13.13± 1.8 and 12.89 ± 2.56 in both type 1 and 2 diabetic patient groups, respectively. Study findings revealed that perceived social support had not significant relation with HbA1C in type 1 diabetic patients ($p>0.05$), and had significant relation with HbA1C in type 2 diabetic patients ($p<0.001$). Gender, BMI and marital status variables had significant relation with perceived social support from family and HbA1C in both type 1 and type 2 diabetic patients ($p<0.001$). Also, variable age in type 2 diabetic patients had significant relation with perceived social support and HbA1C ($p=0.05$). However, variables of education had not significant relation with perceived social support and HbA1C among type 1 diabetic patients. Disease duration did not show any statistical relation with perceived social support and HbA1C among type1 and 2 diabetes patients.

Conclusion: Perceived social support from family is an important psychosocial factor affecting glycemic control in patients with type 2 diabetes other than patients with type1 diabetes.

Keywords: Perceived social support, Type 1 diabetes, Type 2 diabetes, Glycemic control

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Introduction

Diabetes type 2 is a metabolic disorder which is becoming an increasingly prevalent worldwide [1]. As a determinant of epidemiologic transition, diabetes is recognized as a major health concern in both developed and developing countries [2]. Social support in diabetes is defined as a critical component of mental health promotion and a psychological aspect of social networking towards coping with diabetes barriers [3]. Social support is usually assessed through others as a resource and is perceived through social ties such as family, spouse and friends [4]. Because of the nature and illness chronicity of diabetes, it is crucial to provide additional strategies regarding the diabetes control. Diabetes control is an important challenge for most people who live with diabetes [5].

Some researches revealed that perceived social support plays a key role in diabetes control [6]. This is due to the fact that diabetes control is closely related to the adoption of self-management behaviors by patients who in turn can be supported from families [7, 8]. This means that perceived social support could potentially enhance patient ability to cope better with stressful events in their living environment.

In order to determine adoption of self-manage-ment behavior and glycemic control, HbA1C is considers as gold standard. WHO has a standard classification which used in this study [9-11].

Recent studies have revealed that family behaviors and types of communication with adherence to treatment regime and glycemic control as well as negative perceived social support from family can cause poor diabetes control [12]. Yet, the role of perceived social support in diabetes control and coping with environmental is often neglected [13].

This study was assigned to evaluate if perceived social support from family, selected demographic variables, and disease characteristics are related to diabetes glycemic control.

Methods

Participants

All diabetic patients were chosen from teaching hospitals affiliated with Tehran University of Medical Sciences. The patients were invited to participate in the study, and to indicate their perceived family support and factors influenceing their disease. The inclusion criteria included: (1) diagnosed diabetes (type 1 or type 2) for at least 1 year, (2) living with families, friends or relatives, and (3) able to fill out informed consent. The exclusion criteria were: (1) having major psychiatric problems which can interfere with the recognition of perceived support and (2) initiating insulin treatment for at least 6-month before the study started, since this would represent a major change in disease management that would require regulation from both patients and family members and may not correctly reveal the perceived support. Finally, the study sample was 430 (113 type 1 and 317 type 2) diabetic patients.

Procedure

The interviewers explained the purpose of the interview to the study participants during their hospitalization, and checked for the inclusion criteria. Those who met the inclusion criteria were given more information about the study and were invited to participate in the study. Family members who accompanied patients were asked to leave the area so the participant could complete the study. The written informed consent was obtained from all eligible participants before commencing the interviews. The participants were selected through a convenience sampling over a period of six months since May 2011. In doing so, the interviewers attended the hospitals affiliated with Tehran University of Medical Sciences and interviewed eligible patients at specific times on weekdays. Participation in the study was voluntarily and patients might withdraw at any time. Each patient was interviewed once.

Measures

The questionnaire consisted of two parts including: Demographic and Health-Related Variables and Perceived Social Support from family. Demographic and Health-Related Variables: Ten items in this questionnaire were age, sex, level of education, marital status, family income, duration of diabetes and body mass index (BMI). HbA1C index was also obtained from available medical records of patients as a clinical measurement of diabetes control. This biochemistry measurement revealed diabetes control within 3 months

before [14]. According to WHO, we classified about the metabolic control index (HbA1C) in three categories including: HbA1C less than %7 as optimal control, HbA1C between %7-8.5 as borderline control and HbA1C over %8.5 as poor control [14]. Perceived Social Support from family: The Perceived Social Support from Family Scale which was developed by Procidano and Heller (1983) is also a 20-item self-report scale which examines how persons perceive support, information and response from their family. The original scale have a good internal consistency with α=0.90 [15]. Some Items of Perceived Social Support from family are like "Get good ideas about how to do things or make things from my family ", "Members of my family share many of my interests ", and" My family is sensitive to my personal needs ". In this questionnaire, Perceived social support from family, was assessed using a 20-item, dichotomous sale (Yes/No).The responses to each item were scored between 0 and 1 (0=No and I don't know, 1 =Yes). The minimum and the maximum score in this scale was 0 and 20, respectively. Higher scores represented higher perceived social support.

Processes of translation and validation for the Perceived Social Support from Family instrument: In translating the English language version of the current instrument into Farsi, the methodology outlined by Banville et al. (2000) was applied [16]. The preliminary translation methodology led to psychometrically-sound and culturally-appropriate measures. Briefly, this included translating the existing instrument into Farsi by the researchers with the assistance of two native Farsi speakers. Next, the researchers and two more bilingual translators who were familiar with psychological issues and diabetes separately back-translated the instrument into English (without accessing or referring to the original English version of the instrument). The three versions were then compared; scrutinized and necessary suggestions were made to resolve any differences. The revised version was next sent to two Farsi-language professionals -familiar with psychological issues and diabetes- for further clarity. The final version of the instrument was then developed based on their feedbacks.

This process helped constructing a suitable content validity necessary for the purposes of the study.

The revised version of the measure was lastly piloted on a sample of 50 diabetic patients (Type 1 and 2) prior to commencing the study. This helped evaluating items clarity, response variance and determining reliability. The respondents completed the survey with no difficulty in perceiving the items. Furthermore, data were analyzed for internal consistency of the scale on the first administration, and for stability of measure two weeks later. Cronbach's coefficient alpha was used to assess the internal consistency of the instrument (α=0.85), and test–retest reliability was performed to measure the instrument stability, resulting in a reliability of 0.88. The results of the pilot study were not included in the main study.

Statistical Analysis

Descriptive statistics were used to describe the basic features of the collected data. Non-parametric test (Mann-Whitney U and Kruskal-Wallis) was also used for variables with non-normal distribution.

Statistical analysis was performed by using SPSS software version 11.5. Results were considered significant at a conventional level of 0.05.

Results

Overall, a response rate of 100% was achieved. Demographic and family characteristics of the participants are presented in Table 1. The average scores of perceived social support were 13.13± 1.8 and 12.89 ± 2.56 for type 1 and 2 diabetic patients, respectively. Study findings revealed that perceived social support from family does not correlate with HbA1C in type 1 diabetic patients ($p>0.05$), and correlate significantly with HbA1C in type 2 diabetic patients ($p<0.001$) (Table 2).

Perceived social support and age group had significant association among 35-60 years old patients with type 2 diabetes (Med=13.5) with optimal HbA1C ($p<0.001$). The association between age variable and social support was not significant in patients with type 1 diabetes. Perceived social support and gender of men had significant association with both types of diabetes, however, the perceived social support

was higher (Med=14) in type 1 diabetic patients with borderline HbA1C (p=0.05), and higher in type 2 diabetic patients with optimal HbA1C (p<0.001) (Table 3).

BMI and perceived social support had significant association among patients with type 1 diabetes (p=0.01) and type 2 diabetes (p<0.001) with optimal and borderline HbA1C (Table 4). Perceived social support had higher association among married among patients with diabetes type 2 patients (Med= 13) with HbA1C lower than 8.5 (p<0.001). Perceived social support was higher among Type 2 diabetic patients with education lower than diploma along with HbA1C lower than 8.5 (p<0.001). Variables such as the level of education and marital status had not significant association with perceived social support and HbA1C among type 1 diabetic patients. No significant association was found between disease duration and perceived social support or HbA1C among patients suffering from type1 and 2 diabetes.

Table 1. Demographic and clinical information of patients

Variable	Type 1 diabetes (n= 113)	Type 2 diabetes (n= 317)
	(%) number	(%) number
Gender		
Female	(52.2)59	(54.6)173
Male	(47.8)54	(45.4)144
Educational level		
Illiterate	(3.5)4	(31.9)101
Lower than diploma	(23)26	(43.5)138
Diploma	31)35	(17)54
Upper than diploma	(42.5)48	(7.6)24
Marital status		
Unmarried	(68.1)77	(4.7)15
Married	(31.9)36	(95.3)302
Metabolic control (HbA1C)		
Optimal control(<%7)	(28.3)32	(56.6)173
Borderline control(%7-8.5)	(41.6)47	(35.3)112
Poor control(>%8.5)	(30.1)34	(10.1)32
BMI		
< 25	(54)61	(38.8)123
26-29.9	(36.3)41	(37.5)119
>30	(9.7)11	(23.7)75

Table 2. Relation between perceived social support scores from family and HbA1C in type1 and 2 diabetic patients

Type of Diabetes	HbA1C	Median of Scores	Kruskal-Wallis test
Type 1 Diabetes	< 7	13	*p*= 0.36
	7-8.5	14	
	>8.5	14	
Type 2 Diabetes	< 7	13	*p*< 0.001
	7-8.5	13	
	>8.5	14	

Table 3. Relationship between perceived social support from family and HbA1C in terms of gender in patients with type 1 and 2 diabetes

Type of Diabetes	Gender	HbA1C	Median of scores	Interquartile range	Kruskal-Wallis test
Type 1 diabetes	Female	< 7	14	2.25	*P* = 0.7
		7-8.5	14	1	
		>8.5	14	1	
	Male	< 7	13	2	*P* = 0.05
		7-8.5	14	1	
		>8.5	13	1	
Type 2 diabetes	Female	< 7	13	1	*P* = 0.001
		7-8.5	13	1	
		>8.5	12	7	
	Male	< 7	14	1	*P* < 0.001
		7-8.5	13	1	
		>8.5	11	9	

Table 4. Comparison of perceived social support from family, HbA1C and BMI in patients with type 1 and 2 diabetes

Type of Diabetes	BMI	HbA1C	Median of scores	Interquartile range	Kruskal-Wallis test
Type 1 Diabetes	<25	< 7	13	2	*P* = 0.12
		7-8.5	14	1	
		>8.5	14	1	
	25-29.9	< 7	14	1.5	*P* = 0.01
		7-8.5	14	1	
		>8.5	13	2	
	>30	< 7	14	3	*P* = 0.57
		7-8.5	13	9	
		>8.5	13.5	1	
Type 2 Diabetes	<25	< 7	13	1	*P* < 0.001
		7-8.5	14	1	
		>8.5	7	8.5	
	25-29.9	< 7	13	1	*P* = 0.001
		7-8.5	13	1	
		>8.5	9.5	9.5	
	>30	< 7	14	14	*P* = 0.007
		7-8.5	13	13	
		>8.5	13	13	

Discussion

This study was performed to the assess relationship between perceived social support from family and diabetes control among type 1 and 2 diabetes patients. Considering the fact that different variables influence diabetes control. Recognition of and focusing on the modifiable determinants of social support can plays an important role in selecting appropriate interventions in order to better interact with diabetic patients and their families [12].

Study findings revealed that perceived social support from family had a significant correlation with HbA1C in patients with type 2 diabetes. This finding is in line with previous studies which have pointed to the significant correlation of social support from family with diabetes indices improvement such as HbA1C [17]. Nicklett & Liang have also found that social support from family had significant relationship with adherence-an important aspect of self-management- in patients with type 2 diabetes [18]. Miller &Davis revealed this fact in their study that social supports facilitate self-management behaviors and diabetes control. They represented that family members and their interaction with health care workers had key roles in informational and emotional support in type 2 diabetic patients [19].

Nonetheless, our study did not showed any significant relationship between perceived

social support from family and HbA1C in patients with type 1 diabetes. This finding is in contrast to earlier findings such as those by Skinner & Hampsons which showed perceived social support from family was a significant predictor of all self-management measures in type 1 diabetic patients [20]. Similar studies have pointed to the role of perceived social support from friends in facilitating diabetes control, largely due to patients' close relationship with their friends and peer support [21].

The results of the current study revealed that male gender and metabolic control correlate significantly with perceived social support. It would appear that Iranian men –mainly due to their culture– have a fundamental role in managing their families, and as such they may pay more attention to social support than women. This is in line with Trief et al. study which showed that Social support including support from spouses and couple relationships can be helpful in diabetes control [22, 23].

Further, perceived social support and age had significant relationship among 35-60 years old patients with type 2 diabetes having an optimal HbA1C and had not statistically significant relationship with type 1 diabetic patients. It is likely that better perceived social support correlates with increasing years of life and the issue of socialization, in which was revealed in current study. On the other hand, Vallis and et al. indicated that increasing age in diabetic patients there prefer to adherence proposal advices towards diabetes control; this finding confirms the findings of our study. They revealed that adherence to treatment regimen had significant relationship with HbA1C improvement [24]. Similarly, Matsuzawa et al. has shown that perceived social support is a predictor of diabetes control in aged diabetes patients [25]. It seems that using supportive strategies to facilitate diabetes adherence can be helpful. Some studies approved that assessing diabetes distress and attitude towards diabetes among them can be improved. This fact is available through using Standard scale such as Problem Areas in Diabetes scale (IR-PAID-20) which tested by Arzaghi et al (2011) [26] . Furthermore, there is an Iranian Diabetes Attitude Scale (IR-DAS-3) which can be used by diabetes educators towards improving diabetes control [27].

In addition, BMI and perceived social support had shown significant relationship with type 1 diabetes and type 2 diabetes having optimal and borderline HbA1C. This finding is similar to the result of the Schwartz's study. It is expected that higher perceived social support score from family cause better adherence to self-management behaviors, and thus health becomes worthy for diabetic patients. In this regard, healthy diet and appropriate physical activity will improve the patients' BMI [28].

We also found that the score of perceived social support was higher among married patients with diabetes type 2 who had an HbA1C level of lower than 8.5. The score was also higher among Type 2 diabetic patients with qualification lower than diploma that had an HbA1C level of 8.5 or less.

Considering the Trief et al. study that showed marital status had played an encouraging role in adaptation to healthy practices regarding diabetes. The adaptation and adherence to one's recommended diet is part of the adaptation to diabetes [22]. As well, spouses usually look after one another during illness thus increasing the possibility of adherence to medical professional recommendation will take place [23], which at times is in the form of diet changes. All of these can be helpful in diabetes control and HbA1c modification.

Finally, it seems that perceived social support from family, as a psychosocial factor, plays a more important role in glycemic control in type 2 diabetic patients than in patients with type 1 diabetes.

Nonetheless, the findings of this study should carefully be interpreted because of some limitations: 1) the study is a cross-sectional one and the causality cannot be easily established. In order to assess the relationship between perceived social support from family and glycemic control some longitudinal studies are recommended, 2) the data collection tool was self-reported, and 3) the sample size was limited to those patients who lived with their families with limited annual income. As such the generalizability of our findings may be questioned. The findings from this study, however, have important suggestions for healthcare professionals to facilitate diabetes control. In particular, healthcare providers are encouraged to support family counseling.

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References

1. Cooper H, Booth K, Gill G. Using combined research methods for exploring diabetes patient education. *Patient Educ Couns* 2003; 51: 45-52.
2. Spinaci S, Currat L, Shetty P, Crowell V, Kehler J. Tough Choices: Investing in health for development: Experiences from national follow up to commission on macroeconomics and health. WHO Report; 2006.
3. 3.Coelho R, Amorim I, Prata J. Coping Styles and quality of life in patients with non-insulin dependent diabetes mellitus. *Psychosomatics* 2003; 44:312-318.
4. Glasgow RE, Strycker LA, Toobert TJ, Eakin E. A social-ecologic approach to assessing support for disease self- management: The Chronic Illness Resource Survey. *Journal of Behavior Medicine* 2000; 23:559-583.
5. Zhang L, Albert A, Krzentowski G, Lefebvre PJ. Risk of developing retinopathy in diabetes control and complications trial type 1 diabetic patients with good or poor metabolic control. *Diabetes care* 2001; 24:1275-1279.
6. Tang Ts, Brown MB, Funnell MM, Anderson RM. Social support, Quality of life, and self-care behaviors among African Americans with type 2 diabetes. *Diabetes Educators* 2008; 34: 266-276.
7. Fisher L, Chesla C, Skaff MM, Gilliss C, Mullan JT, Bartz RJ, Kanter RA, Lutz CP. The family and disease management in Hispanic and European-American patients with type 2 diabetes. *Diabetes Care* 2000; 23(3): 267-272.
8. Edelstein J, Linn MW. The influence of the family on control of diabetes. *Soc Sci Med* 1985; 21(5): 541-544.
9. Ozmen B, Boyvada S. The relationship between self-monitoring of blood glucose control and glycosylated hemoglobin in patients with type 2 diabetes with and without diabetic retinopathy. *Journal of diabetes and its complications* 2003; 17: 128-134.
10. Matz R .The target of good glycemic control should be an HgA1C concentration of less than 0.07. *The Western Journal of Medicine* 2000; 173: 179-180.
11. Manly S. hemoglobin A1C-a marker for complications of type 2 diabetes: The experience from the UK prospective Diabetes Study (UKPDS). *Clinical chemistry & Laboratory Medicine* 2003; 41:1182-1190.
12. Argyle M. Benefits Produced by Supportive Social Relationships. The Meaning and Measurement of Social Support. New York: Hemisphere Publishing Corporation; 1992.
13. Burleson RB, Al-Brecht TL, Goldsmith DJ, Sarason IG. Communication of social support massages, interaction, relationships and community. (INC): Sage Publication; 1994.
14. American Diabetes Association. Standards of medical care diabetes. *Diabetes Care* 2009; 32 (Suppl 1): S13-S61.
15. Procidano ME, Heller K. Measures of Perceived Social Support from Friends and From Family: Three Validation Studies. *American Journal of Community Psychology* 1983; 11(1): 1-24.
16. Banville D, Desrosiers P, Genet-Volet Y. Translating questionnaires and inventories using a cross-cultural translation technique. *Journal of Teaching in Physical Education* 2000; 19: 374-387.
17. King D, Glasgow R, Toobert D R, Strycker L, Estabrooks P, Osuna D, et al. Self-Efficacy, Problem Solving, and Social-Environmental Support Are Associated with Diabetes Self-Management Behaviors. *Diabetes care* 2010; 33: 751-753.
18. Nicklett E, Liang J. Diabetes-Related Support, Regimen Adherence, and Health Decline Among Older Adults. *Journal of Gerontology: Social Sciences* 2009; 65B (3): 390–399
19. Miller CK, Davis MS. The Influential Role of Social Support in Diabetes Management. *Topics in Clinical Nutrition* 2005; 20(2): 157-165.
20. Skinner TC, Hampson SE. Social support and personal models of diabetes in relation to self-care and well-being in adolescents with type I diabetes mellitus. *Journal of Adolescence* 1998; 21: 703-715.
21. Bearman KJ, La Greca AN. Assessing Friend Support of Adolescents' Diabetes Care: The Diabetes Social Support Questionnaire-Friends Version. *J of Pediatric Psychology* 2002; 27(5): 417-428.
22. Trief PM, Himes CL, Orendorff R, Weinstock RS. The Marital Relationship and Psychosocial Adaptation and Glycemic Control of Individuals with Diabetes. *Diabetes Care* 2001; 24(8): 1384-1388.
23. Trief PM, Wade MJ, Britton KD, Weinstock RS. A Prospective Analysis of Marital Relationship Factors and Quality of Life in Diabetes. *Diabetes Care* 2002; 25(7): 1154-1158.

24. 24.Vallis M, Ruggiero L, Greene G, Jones H, Zinman B, Rossi S, Edwards L, Rossi JS, Prochaska JO. Stages of Change for Healthy Eating in Diabetes: Relation to demographic, eating-related, health care utilization, and psychosocial factors. *Diabetes Care* 2003; 26(5): 1468-1474.
25. Matsuzawa T, Sakurai T, Kuranaga M, Endo H, Yokono K. Predictive Factors for Hospitalized and Institutionalized Care-giving of the Aged Patients with Diabetes Mellitus in Japan. *Kobe J. Med. Sci* 2010; 56(4): E173-E83.
26. Arzaghi SM, Mahjouri MY, Heshmat R, Khashayar P, Larijani B. Psychometric properties of the Iranian version of the Problem Areas in Diabetes scale (IR-PAID-20). *Journal of Diabetes and Metabolic Disorders* 2011; Vol 10, pp 1- 7.
27. Mahjouri MY, Arzaghi SM, Qorbani M, Nasli-Esfahani E, Larijani B. Evaluation of psychometric properties of the third version of the Iranian Diabetes Attitude Scale (IR-DAS-3). *Iranian Journal of Diabetes and Lipid Disorders* 2011; Vol 10, pp 1- 6.
28. Schwartz A. Perceived social support and self-management of diabetes among adults 40 years and over [dissertation]. Oxford (OH). Miami University; 2005.