Social Capital and Related Factors in Women With Gestational Diabetes Mellitus in the North of Iran

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Abstract

Objectives: Gestational diabetes mellitus (GDM) is one of the most important medical conditions in high-risk pregnancies. Social capital is one of the essential factors affecting the prevention and control of diabetes and the blood glucose level. The purpose of this study was to investigate the level of social capital and its related factors in GDM in the north of Iran.

Materials and Methods: This cross-sectional study was conducted on 212 GDM women who referred to diabetes centers at Razi hospital in Ghaemshahr and Imam Khomeini hospital in Sari in 2019. The women were selected through the convenience sampling method. The data collection tools included Medical-Demographics Information Form and Onyx-Bullen's Social Capital Questionnaire. Finally, data were analyzed by SPSS (version 25) using descriptive and inferential statistics (multiple regression analysis).

Results: The results of this study showed that the mean (standard deviation, SD) of age for GDM women was 29.28 (±5.75). The majority of women (58%) had an academic education. The mean (SD) of social capital was 96.46 (±21.17). Based on the results, a positive and significant correlation was observed between spouse's education (lower than high school, $P=0.001$ and academic education, $P=0.001$), wife's occupation (employee, $P=0.015$), spouse's occupation (employee, $P=0.027$), and fasting blood sugar (FBS) ($P=0.048$), as well as a significant negative correlation with 2-hour FBS ($P=0.048$), 1-hour postprandial glucose level ($P=0.001$), economic status (dissatisfied, $P=0.42$), overweight ($P=0.009$), and obesity ($P=0.020$).

Conclusions: The social capital of GDM women is influenced by various socio-economic factors. According to the findings of this study, women who are economically disadvantaged, overweight, obese, and at high blood sugar levels are at greater risk of rejecting treatment due to low social capital, resulting in poor blood sugar control. Therefore, interventions related to promoting social capital in these groups should be pursued more vigorously, and strengthening of social capital and its influencing factors should be considered as one of the main approaches of health promotion.

Keywords: Social capital, Related factors, Gestational diabetes mellitus

Introduction

Gestational diabetes mellitus (GDM) is considered as one of the most important medical conditions in high-risk pregnancies. The GDM refers to any degree of glucose intolerance with onset or first detection during pregnancy (1). It is considered as a multiple-cause metabolic disorder that destroys carbohydrate, fat, and protein metabolism as a result of impaired insulin release, insulin function, or both (2) and is expressed as a critical event in female reproductive life, indicating the risk of future glucose intolerance (1). Gestational diabetes has highly serious consequences for the mother and the fetus (3,4). The prevalence of gestational diabetes is increasing (5) and its prevalence has been differently reported in various studies. In general, the global prevalence of gestational diabetes is about 1%-14%, and this rate varies across the world according to age, gender, diagnostic criteria, and screening for gestational diabetes, race, and ethnicity (6,7). According to previous studies, despite the use of oral

and injectable therapies to control blood sugar levels, most people have inadequate blood sugar control, which may be attributed to ignoring the role of the social determinants of health, including socio-economic affecting health outcomes (2,8). Nowadays, social capital is one of the social determinants of health that has attracted researchers (9). The Word Bank introduces the social capital as the hidden wealth of a society and considers this phenomenon to be the result of the influence of social institutions, human relationships, and norms on the quantity and quality of social interactions (6). Previous research revealed a relationship between social capital and the prevalence of GDM (10). Social capital plays an effective role in the prevention and control of diabetes by reducing high-risk behaviors and adhering to the recommended diet and treatment regimens (11) although the association between social capital and related factors in GDM is unclear. Therefore, this study aimed at investigating the amount of social capital and its related factors in women with

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gestational diabetes referring to Ghaemshahr Diabetes Center and Imam Khomeini hospital in Sari. It is hoped that we can take an effective step in better controlling the blood sugar of pregnant women and reduce maternal and neonatal complications by identifying factors associated with social capital in women with gestational diabetes.

Materials and Methods

The present cross-sectional study was performed on 212 GDM women who referred to diabetes centers at Razi hospital in Ghaemshahr and Imam Khomeini hospital in Sari, Mazandaran province, Iran. The samples were selected by the convenient sampling method from 2019 May to December 2019. The study inclusion criteria included physician-approved GDM through a medical record study, maternal gestational age of 24-28 weeks, absence of addiction to drugs such as psychotropic and stimulants, alcoholic beverages, and cigarettes and hookahs. Moreover, other criteria were no history of medical illness (e.g., diabetes, heart, respiratory and kidney diseases, thyroid disorders, epilepsy, and hypertension), no history of high-risk pregnancy (e.g., preeclampsia, abnormal bleeding, placenta previa, and twin pregnancy), no history of admission to psychiatry and taking psychiatric drugs (3,12). Then, the samples filled the research questionnaires with ethical considerations.

The sample size in the study was estimated to be 212 participants with an alpha level of less than 0.05 and a statistical test power of 80%, assuming a two-tailed hypothesis, and finally, taking into account the effect size of 0.1. Data collection tools included Medical-Demographics Questionnaire and Onyx-Bullen's Social Capital Questionnaire.

1. *Medical-Demographics Information Form:* This form contained questions regarding wife's age, gestational age, fasting blood sugar (FBS), 1-hour postprandial glucose (1 h-PPG) level, 2-hour PPG, spouse's education, wife's education, spouse's occupation, wife's occupation, number of children, economic status, and body mass index (BMI). These data were collected by the researcher through referring to the case file in the ward or through face-to-face questioning.

2. *Onyx and Bullen's Social Capital Questionnaire:* This 36-item questionnaire was first designed by Onyx and Bullen in 2000, whose main purpose is to measure individuals' social capital (5). The questions of this tool are extracted from the Integrated Questionnaire of World Bank (4,6,7). According to (5,14), this tool contains eight dimensions or sub-scales (13) encompassing the value of life (3 items), tolerance of diversity (3 items), connections with neighbors (5 items), connections with friends and family (3 items), work connections (4 items), participation in local communities (7 items), feeling of trust and safety (5 items), and feeling of proactivity (6 items). All 36 social communication questionnaire items were provided with a 3-point Likert-type scale ranging from 1-3 (no, not much or no, and not at all). A higher score indicates more social capital (15).

The psychometric properties of the Persian version of the Onyx Social Capital Scale were evaluated and the results showed acceptable validity and reliability (16-18).

The internal consistency of this questionnaire in this study was calculated as 0.72 by Cronbach's alpha. Data were analyzed using SPSS 25. Descriptive statistics (i.e., frequency, mean, and standard deviation) and inferential statistics (i.e., multiple regression analysis) were used to describe the data.

Results

A summary of the medical-demographic characteristics of the samples is shown in Table 1. The results revealed that the mean (SD) of age for GDM women was 29.28 (±5.75). Their mean gestational age was 26.32 weeks. The majority of women (82.1%) and their spouses (50.9%) were housewives and self-employed, respectively. Additionally, most women (58%) and their spouses (61.3%) had

Table 1. Frequency Distribution of the Demographic Characteristics of Women With Gestational Diabetes mellitus (n=212)

Variables	Categories	No.	%
Wife's education	Illiterate	12	5.7
	<High school	77	36.3
	Academic	123	58.00
Spouse's education	Illiterate	11	5.2
	<High school	71	33.5
	Academic	130	61.3
Wife's occupation	Housekeeper	174	82.1
	Employee	34	17.9
Spouse's occupation	Unemployed	22	10.4
	Employee	48	22.6
	Worker	108	50.9
	Other	3	16.0
Number of children	0	131	61.8
	1	57	26.9
	≥2	24	11.3
Economic status	Very satisfied	41	19.3
	Satisfied	36	17
	Relatively satisfied	45	21.2
	Dissatisfied	42	19.8
	Very dissatisfied	48	22.6
Body mass index	Lean (<19.8)	20	9.4
	Normal (19.8-25.9)	70	33.0
	Overweight (26-29)	112	52.8
	Obese (>29)	10	4.7

academic education. Based on the results, the majority of women (61.8%) had no children. The other characteristics of the participants are listed in Table 2.

Our findings showed that the mean (SD) of the total score of social capital was 96.46 (± 21.17), indicating that the GDM women had low levels of social capital (Table 2).

The results of the multivariate regression model (Table 3) represented that the social capital had a significant positive correlation with spouse's education (lower than

high school, $P = 0.001$ and academic education, $P = 0.001$), wife's occupation (employee, $P = 0.015$), spouse's occupation (employee, $P = 0.027$), and FBS ($P = 0.048$).

Based on the data in Table 3, a significant negative relationship was found between social capital with the 2 h-PPG level ($P = 0.010$), 1 h-PPG level ($P = 0.001$), economic status (dissatisfied, $P = 0.42$), overweight ($P = 0.009$), and obesity ($P = 0.020$).

Discussion

This study assessed the amount of social capital and its related factors in women with gestational diabetes. Nowadays, social capital is considered as a fundamental issue given its potential for improving, preventing, and controlling diabetes and blood glucose level (10).

Table 2. Descriptive Statistics of Social Capital in Women With Gestational Diabetes Mellitus

Variables	Minimum	Maximum	Mean	Standard Deviation
Total social capital	49	131	96.46	21.17

Table 3. Predictive Value of Social Capital Variance Based on the Demographic Variables of Women With Gestational Diabetes Mellitus

Independent Variables	B	Standard Error	Beta	t	P Value	Confidence Interval	
						Lower Limit	Upper Limit
Constant value	70.491	8.493	-	8.300	0.001	53.740	87.242
Wife's education							
Illiterate (reference)							
<High school	-6.496	6.042	-0.147	-1.071	0.286	-18.387	5.449
Academic	10.586	6.031	0.247	1.755	0.081	-1.310	22.482
Spouse's education							
Illiterate (reference)							
<High school	28.472	6.414	0.636	4.439	0.001	15.821	41.124
Academic	52.681	6.368	1.215	8.272	0.001	40.120	65.243
Wife's occupation							
Housekeeper (reference)							
Employee	2.686	1.095	0.049	2.453	0.015	0.526	4.845
Spouse's occupation							
Unemployed (reference)							
Employee	3.784	1.700	0.075	2.225	0.027	0.429	7.138
Worker	-0.036	1.480	-0.001	-0.024	0.981	-2.955	2.883
Gestational age	-0.454	0.276	0.032	-1.645	0.102	-0.999	0.090
Number of children							
0							
1	1.628	1.011	0.034	1.610	0.109	-0.366	3.623
≥2	-1.491	1.458	-0.022	-1.023	0.308	-4.367	1.385
Fasting blood sugar	0.042	0.021	0.050	1.987	0.048	0.000	0.083
1-hour postprandial glucose level	-0.137	0.035	-0.163	-3.851	0.000	-0.207	-0.067
2-hour postprandial glucose level	0.104	0.040	0.119	2.589	0.010	0.025	0.184
Economic status							
Very satisfied							
Satisfied	-0.643	1.459	-0.011	-0.440	0.660	-3.521	2.236
Relatively satisfied	-2.255	1.441	-0.044	-1.565	0.119	-5.097	0.587
Dissatisfied	-3.665	1.792	-0.069	-2.044	0.042	-7.200	-0.129
Very dissatisfied	-1.947	1.786	-0.039	-1.090	0.277	-5.470	1.576
Body mass index							
Lean (<19.8)							
Normal (19.8-25.9)	-1.786	1.505	-0.040	-1.187	0.237	-4.754	1.182
Overweight (26-29)	-4.182	1.580	-0.099	-2.646	0.009	-7.299	-1.065
Obese (>29)	-5.536	2.376	-0.056	-2.342	0.020	-10.249	-0.877

The results indicated that women with GDM had a low level of social capital, which is in line with the results of Yamada et al (19) while is inconsistent with the findings of Bahrami et al (20). This finding can be justified by the fact that the level of social capital decreases with the development of modern culture and modernization, as well as the advancement of amenities, communication, and expansion of cities, and in general, the move to higher levels. More precisely, increasing facilities and modernization and advances in technology will lead people to spend less time with family and relatives, thereby reducing the likelihood of being together and subsequently friendships, increasing the feeling of loneliness of individuals, and eventually, decreasing the social capital.

The result further demonstrated a significant relationship between spouse's education and social capital, which can be one of the predictor variables of social capital, which corroborates with the finding of Glaeser, Nateghpour, Saberi, and Ashrafi et al (21-24). It can be argued that the improvement of moderately effective factors such as education can positively affect this enormous human capital. In other words, increasing spouse's education leads to a broader insight into their families and their spouses, thus providing more effective and efficient solidarity, and strengthening the family foundations.

Furthermore, the results of the present study showed that couples' employment has a significant positive relationship with social capital. In other words, the employed status increases social capital. This result is in conformity with the findings of Abdolmaleki et al (25), Salarzadeh and Hasanzadeh (26), Haghighatian and Moradi (27), and Ali Beygi et al (28). Accordingly, social capital can represent a set of institutionalized and sustained activities that improve the economic status in a variety of ways. Additionally, economic progression can pave the way for cultural and social development, improve disease control, and increase the awareness of the adverse effects of the disease on the mother and the fetus. Thus, employed people are more connected to people and technology because of their presence in the community and benefit from the highest medical facilities for patient control and treatment due to financial independence and greater facilities.

The results implied that social capital is a predictor of the blood sugar level in patients with GDM, which matches the findings of Valipour (29) and Long et al(30). Other studies showed that social capital is a predictor of diabetes and obesity, and higher levels of social capital protect obesity and diabetes, suggesting that social environments may be destructive or protective of one's health and the incidence or prevention of diseases such as obesity and diabetes (31, 32). Thus, the promotion of capital and social education levels, which go beyond the level of individual education, can prevent the occurrence of diseases (11). Another study reported that social capital enhances public trust and engagement (33). Living in a community where people work together is a sign of the effectiveness of social capital and the ability to stimulate useful actions in preventing and controlling disease in the community, including public engagement and co-operation, which is of particular importance in terms of the health of diabetics (30). The results of a study by Miyamoto demonstrated that health-promotion activities should aim at enhancing the formation of empathetic friendships through individual networks based on bringing individuals who need support to compatible places, thereby enhancing their level of social capital and ability to prevent and better control the disease (34).

Our result also showed a significant correlation between social capital and BMI, which is in line with the findings of Islam (35) and Carrillo-Álvarez et al (18). Based on the results of the current study, social capital can provide conditions for the prevention and control of diabetes by increasing physical resources, including maintaining a normal BMI. People with social capital also gain the ability to access social, family, medical, and community resources and use them to improve their health. In addition, patients with high levels of social capital actively seek information, material, and emotional networks, adhere to social norms and peer control, and work closely with them in their daily activities, all of which can lead to adequate medical and psychological services for the suffering of diabetes (36,37).

Limitations
One of the limitations of this study is the non-use of random sampling that reduces the generalizing of the study results. In addition, this study relies on self-report measurements, which may be susceptible to reporting bias and leading to information bias.

Conclusions
The social capital of GDM women is influenced by various socio-economic factors. According to the findings of this study, women who are economically disadvantaged, overweight, obese, and at high blood sugar levels are at greater risk of rejecting treatment due to low social capital, resulting in poor blood sugar control. Therefore, interventions related to promoting social capital in these groups should be pursued more vigorously. Finally, the strengthening of social capital and its influencing factors should be considered as one of the main approaches of health promotion as well.

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