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 World 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...
The purpose of this study was to investigate the role of social capital in better control of gestational diabetes. Also, prevention of maternal and fetal complications of gestational diabetes is with better control of 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 Information Form 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 a history of admission to psychiatry and taking psychiatric drugs (3,12). Then, the samples filled the research questionnaires with ethical considerations.

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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  | 35.5|
|                         | Academic          | 130 | 63.1|
| 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   | 1.4 |
| 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 | 22.4|
|                         | 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 |
|-----------------------|---------|----------------|------|---------|--------------|--------------------|
| 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              | 7.113              |
| 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         | -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 findings 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 cooperation, 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.

**Authors’ Contribution**

SHM and JG conceived and designed the study, conducted research, provided research materials, and collected and organized data. JG supervised the research process. MA and EYA analyzed and interpreted data. SHM and JG wrote initial and final draft of article, and provided logistic support. All authors have critically reviewed and approved the final draft and are responsible for the content and similarity index of the manuscript.
Conflict of Interests
Authors declare that they have no conflict of interests.

Ethical Issues
This project was approved by the Student Research Committee of Mazandaran University of Medical Sciences, Sari, Iran (Ethical code: IR.MAZUMS.REC.1398.4675). The written consent form was completed by all participants, and all ethical principles of this study were conducted by the researchers.

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References
1. Alayoub H, Curran S, Coffey M, Hatunic M, Higgins M. Assessment of the effectiveness of group education on knowledge for women with newly diagnosed gestational diabetes. Ir J Med Sci. 2018;187(1):65-68. doi:10.1007/s11845-017-1609-9
2. Vassilev I, Rogers A, Sanders C, et al. Social networks, social capital and chronic illness self-management: a realist review. Chronic Illn. 2011;7(1):60-86. doi:10.1177/1742395310338338
3. Khadivzadeh T, Hoseinzadeh M, Azhari S, Esmaily H, Akhlaghi F, Sardar MA. Effects of self-care education on perceived stress in women with gestational diabetes under insulin treatment. Evidence Based Care. 2015;5(3):7-18. doi:10.22038/ebcj.2015.4850
4. Rimaz S, Nikooseresht Z, Vesali S, Nedjat S, Asadi-Lari M. A study on factors that drive variation in the levels of social capital among people living with HIV/AIDS in Iran. Glob J Health Sci. 2015;7(3):351-357. doi:10.5539/gjhs.v7n3p351
5. Moradiz Sorkhalaee M, Eftekhar Ardehili H, Nedjat S, Saiepour N. Social capital among medical students of Tehran University of Medical Sciences in 2011. Razi Journal of Medical Sciences. 2012;19(102):30-37. [Persian].
6. Baharei A, Bakouei F, Balouei S, Eskandari N, Ahmari Tehran H. Social capital as a determinant of self-rated health in women of reproductive age: a population-based study, Glob J Health Sci. 2015;8(2):273-280. doi:10.5539/gjhs.v8n2p273
7. Grootaert C. Measuring Social Capital: An Integrated Questionnaire. Washington, DC: World Bank; 2004.
8. Buck-McFadyen E, Akhtar-Danes N, Isaacs S, Leipert B, Strachan P, Valaitis R. Social capital and self-rated health: a cross-sectional study of the general social survey data comparing rural and urban adults in Ontario. Health Soc Care Community. 2019;27(2):424-436. doi:10.1111/hsc.12662
9. Poortinga W. Social relations or social capital? individual and community health effects of bonding social capital. Soc Sci Med. 2006;63(1):255-270. doi:10.1016/j.soscimed.2005.11.039
10. Mizuno S, Nishigori H, Sugiyama T, et al. Association between social capital and the prevalence of gestational diabetes mellitus: an interim report of the Japan Environment and Children’s Study. Diabetes Res Clin Pract. 2016;120:132-141. doi:10.1016/j.diabres.2016.07.020
11. Holtgrave DR, Crosby R. Is social capital a protective factor against obesity and diabetes? findings from an exploratory study. Ann Epidemiol. 2006;16(5):406-408. doi:10.1016/j.anneuped.2005.04.017
12. Kordi M, Banaei M, Asghanpour N, Mazloum SR, Akhlaghi F. Prediction of self-care behaviors of women with gestational diabetes based on belief of person in own ability (self-efficacy). Iran J Obstet Gynecol Infertil. 2016;19(13):6-17. [Persian].
13. Keshavarz H, Bahramian M, Mohajerani AA, Hosseinpoor K. Factors effective in changing of reproductive behaviors of nomadic and non-nomadic tribes in the Seminor province, Iran. Health System Research. 2012;8(3):456-465. [Persian].
14. Onyx J, Bullen P. Measuring social capital in five communities. J Appl Behav Sci. 2000;36(1):23-42. doi:10.1177/00218863003601002
15. Bühlner C, Filipovic D. Social capital related to fertility: theoretical foundations and empirical evidence from Bulgaria. Vienna Yarh Popul Res. 2005;1:53-81.
16. Yari A, Nadrian H, Rashidian H, et al. Psychometric properties of the Persian version of Social Capital Questionnaire in Iran. Med J Islam Repub Iran. 2014;28:17.
17. Bacchi-Modena A, Bolis P, Campagnoli C, et al. Efficacy and tolerability of Estraderm MX, a new estradiol matrix patch. Maturitas. 1999;27(3):285-292. doi:10.1016/s0378-5122(97)00039-x
18. Carrillo-Álvarez E, Kawachi I, Riera-Romani J. Neighbourhood social capital and obesity: a systematic review of the literature. Obes Rev. 2019;20(1):119-141. doi:10.1111/obr.12760
19. Yamada Y, Suematsu M, Takahashi N, et al. Identifying the social capital influencing diabetes control in Japan. Nagoya J Med Sci. 2018;80(1):99-107. doi:10.18999/nagjms.80.1.99
20. Bahrami A, Amiri A, Montazerifaraj R, Dehghan H. The relationship between social capital dimensions and perceived health in Yazd urban society, 2013. Tolooebehdasht. 2016;15(3):67-77. [Persian].
21. Saberi B, Nedjat S, Fotouhi A, Rajab A, Montazeri A. Social capital and its related factors in patients with type 2 diabetes. Payesh. 2018;17(2):137-146. [Persian].
22. Nateghpour M. Social capital and factors affecting its formation in Tehran. Iranian Journal of Sociology. 2005;6(4):143-152.
23. Glaeser EL. The formation of social capital. Can J Policy Res. 2001;2(1):34-40.
24. Ashrafi E, Montazeri A, Mousavi M, Vaez-Mahdavi MR, Asadi-Lari M. Influence of sociodemographic features and general health on social capital: findings from a large population-based survey in Tehran, Iran (Urban-HEART). Public Health. 2012;126(9):796-803. doi:10.1016/j.puhe.2012.06.013
25. Abdolmaleki H, Goodarzi M, Noorizadeh A. Investigating the Relationship between Social Capital and Job Satisfaction of Physical Education Teachers in Hamadan. Journal of Social Capital Management. 2014;1(1):63-80.
26. Salarzadeh N, Hasanzadeh D. The effect of social capital on job satisfaction of teachers. Journal of Social Sciences. 2006;33:1-26. [Persian].
27. Haghighatian M, Moradi G. The role of social capital in work satisfaction (case: the staff of cooperative organization of Kermanshah province). Journal of Applied Sociology. 2012;22(44):115-130. [Persian].
28. Ali Beygi AH, Jafariniya M, Ghorbani M, Sulaimany A. The relationship between social capital and job satisfaction among farmers of Kermanshah township. Journal of Applied Sociology. 2012;22(44):115-130. [Persian].
29. Valipour M. The Relationship between Social Capital and Blood Glucose Control in Patients with Type 2 Diabetes in Urban and Rural Areas of Lorestan Province [thesis]. Tehran: Tehran University of Medical Sciences; 2002. [Persian].
30. Long JA, Field S, Armstrong K, Chang VW, Metlay JP. Social capital and glucose control. J Community Health.
31. Holtgrave DR, Crosby RA. Social determinants of tuberculosis case rates in the United States. Am J Prev Med. 2004;26(2):159-162. doi:10.1016/j.amepre.2003.10.014

32. Holtgrave DR, Crosby RA. Social capital, poverty, and income inequality as predictors of gonorrhea, syphilis, chlamydia and AIDS case rates in the United States. Sex Transm Infect. 2003;79(1):62-64. doi:10.1136/sti.79.1.62

33. Walker RJ, Garacci E, Palatnik A, Ozieh MN, Egede LE. The longitudinal influence of social determinants of health on glycemic control in elderly adults with diabetes. Diabetes Care. 2020;43(4):759-766. doi:10.2337/dc19-1586

34. Miyamoto K, Iwakuma M, Nakayama T. Social capital and health: implication for health promotion by lay citizens in Japan. Glob Health Promot. 2015;22(4):5-19. doi:10.1177/1757975914547547

35. Islam MK, Merlo J, Kawachi I, Lindström M, Gerdtham UG. Social capital and health: does egalitarianism matter? a literature review. Int J Equity Health. 2006;5:3. doi:10.1186/1475-9276-5-3

36. Hu F, Niu L, Chen R, Ma Y, Qin X, Hu Z. The association between social capital and quality of life among type 2 diabetes patients in Anhui province, China: a cross-sectional study. BMC Public Health. 2015;15:786. doi:10.1186/s12889-015-2138-y

37. Kamimura A, Tabler J, Nourian MM, Assasnik N, Wright L, Ashby J. Prevention and management of hypertension and diabetes using social capital and physical activity among socioeconomically disadvantaged populations. Fam Community Health. 2017;40(3):205-211. doi:10.1097/fch.0000000000000156

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