



Causal Aspects of Social Capital of Iranian Patients with Cancer: Evidence of Predictive, Modifying and Descriptive Effects in Health Inequality

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Abstract

Background: There is a good literature confirming the effects of social capital on different health domains. The increase in different types of cancer has caused scientists to encounter a number of issues regarding the reasons of affliction by this disease. The aim of this empirical research was to study the causal aspects of social capital of Iranian patients with cancer.

Methods: The study was a causal-comparative study conducted in the spring and summer of 2010 in Tehran. The sample consists of 212 people selected based on affliction or no affliction to cancer. Social capital emphasizes two dimensions of structure and cognition. Social participation, social trust and sense of social solidarity are considered as different dimensions of social capital. The focus has been on personal social capital.

Results: The effect and association of social capital are not significant with any of stomach and colon cancers. The effect and association of social trust are not significant with any of stomach, colon and breast cancers.

Conclusion: People with similar social capital in their life have different experiences of cancer-related stress and unhealthy behaviors. Thus a specific feature of a stressful social determinant is not a reliable criterion to determine the degree of stress and the extent of its effect on affliction to cancer.

Keywords: Cancer, Health inequality, Public health, Social capital

Introduction

Health inequalities are a grave social injustice which also humiliates social justice (1). Grievous health inequalities which are apparent within and among countries are an indication of a global challenge (2).

At international level, there has been an increasing attention towards the reasons of health inequalities, which has drawn everyone's attention to determinants of health, especially social determinants of health in societies (3). In this regard, one of the social determinants that can play a major role in health and disease inequalities is social

capital (4-7). Disagreement has arisen about how best to define social capital. These differences fall along the two research lines, that of social networks and social support. Social capital, as defined by its principal theorists, is a concept that attempts to describe the quantity and quality of social interactions in a community (8-9). Social capital can broadly be defined as the structured social networks, trusting relationships and cultural norms that act as resources for individuals and facilitate collective action (10). Some commentators distinguish between cognitive and structural

components of social capital; the cognitive components are said to include norms, values, attitudes and beliefs, whilst the structural components refer to externally observable aspects of social organisation, such as the density of social networks or patterns of civic engagement (11).

The idea of social capital can best be understood in terms of the role of "society" in personal health. In social capital framework, the way we organize our societies, the amount of contribution we make towards interaction between people, and the degree of trust and cohesion in communities are likely to be the most important determinants of our health (12). However, the amount of social capital that people attain is different depending on their social position. Individuals cannot all have equal access to valuable social resources that are available to them through social capital. Therefore, some individuals have more resources to fight diseases. Irrespective of measurement decisions, positive effects of social capital have been documented across a number of health domains, including better community health (13), more use of primary care (14), better child welfare (15), reductions in rates of tuberculosis (16), and reductions in mortality and morbidity (17). An important implication of these findings is that to improve people's health and well-being, their social capital should be increased. What precisely does it mean, however, to increase social capital? In what follows we try to answer the question regarding different types of social capital.

Affliction to cancer includes a set of physical, mental, social, cultural and economic issues and influences all aspects of the person's life and his/her different stages of life (18- 22). Cancer is typically a middle-age and old-age disease, and its frequency in a society which turns to elderliness and ageing is increasing. In Iran, cancer is the third cause of mortality (23, 24). Based on the results of cancer record program in Iran in recent years, the most frequent cancers after skin cancers are stomach cancer in men and breast cancer in women. In contrast with western countries and Japan, the rate of stomach cancer in Iran has been increasing during the past two decades (25).

According to the World Health Organization, Iran is the second country with the highest rate of mortality due to cancer in the eastern part of the Middle East (26).

Although in recent decades, social determinants of cancer incident attracted a lot of attention, social capital has not been received much attention. Further work in this area requires that we show how social capital affects health (27).

The aim of this empirical research is to study the causal relationship between different dimensions of social capital and cancer affliction in individuals who have been referred to Cancer Institute of Tehran. The results and outcomes of this study can have predictive, modifying or descriptive effects on medical practice.

In order to explain the effect of different dimensions of social capital in affliction to cancer, a conceptual framework has been adopted to which different explanatory variables with different analytical levels contribute. The framework illustrates the relationship between social capital and affliction to cancer through the mediation of different explanatory factors, and social capital and psychological/ behavioral and biological explanatory factors were considered in the conceptual model such that they encompass the three different analytical levels. Social capital as an upstream and distal social factor determines or forms individual or group behaviors (28-29). These psychological / behavioral explanatory factors are in the second level, and biological explanatory factors are in the last level of cancer. These three analytical levels contribute to both affliction with and prevention from cancer.

Methods

Procedures and Participants

The study was a causal-comparative study conducted in the spring and summer of 2010 in Tehran. In this study, the sample is selected based on affliction or no affliction to cancer. Individuals who are afflicted to the considered type of cancer (case group) have been compared with those who are not afflicted to cancer (control group) but are

similar in other features such as age, marital status, household monthly income, gender and genetic background. In fact, the past records of those afflicted by cancer are considered to see if they have any features different from the not-afflicted individuals. The study population includes all patients afflicted with stomach, colon and breast cancers, aged over 14, and have been referred to Cancer Institute of Imam Khomeini Hospital.

The case group consists of 106 people (stomach cancer= 28, colon cancer= 31 and breast cancer= 47) which are selected using stratified probability proportionate to size sampling method. In this study, the data collection tool is a questionnaire which has been conducted using structured interview. The data collection process was facilitated by gender-matched facilitators. Facilitators were university lecturers who received training on the study procedures and spoke the local language fluently. Two facilitators per classroom were assigned to facilitate the data collection process.

The research protocol was approved by the University of Tehran Research Ethics Committee. The patients were informed about the purpose of the study and were assured that their responses would be treated confidentially. Respondents were also informed that their participation was entirely voluntary and that they were free to decline to answer any question that made them feel uncomfortable.

Independent variables

Measuring the social capital is a major challenge (30, 31). Most of what is related to social capital is relational and implicit and this makes the measuring process problematic. Most of the works done in this field are based on measured reports imported from the USA with the least possible modifications. In local conditions, shared relationships and values have a very important role and their impacts are very different from peoples' points of view (32). Different cultures demonstrate social capital in different ways.

We study social capital in the cultural circumstances of Iran. Social capital in different levels, from individual level to international level, is open for discussion. Social capital is a continuous con-

cept whose basis is individual behavior, attitudes and aptitudes. The amount of social capital in every society should be studied with respect to actions that are usually done collectively to attain mutual interests, but these actions are different in different circumstances.

In order to meet different needs and necessities of life in different environmental and cultural circumstances, different forms of actions are made (33). In this study, only those actions are considered for research about social capital that in Iranians' opinion are performed individually not collectively, and therefore, the focus is on "personal social capital" (34).

In this research, social participation, social trust and sense of social solidarity are independent variables and considered as different dimensions of social capital.

Validity has been evaluated using construct validity, and reliability has been measured using Cronbach's Alpha. Cronbach's Alpha's coefficient for social participation, social trust and sense of social solidarity are 66.4, 79.9 and 74.1 respectively. The measurement of social participation has been based on the researcher-constructed 12-items' scale in two general subjective and objective dimensions. The subjective dimension encompasses two secondary dimensions of willingness to be engaged in social participation and willingness to have access to collective interests of social participation. The objective dimension includes three secondary dimensions of participation in controlling, participation in implementing and participation in decision-making.

The measurement of the amount of social trust has been based on the researcher-constructed 20-items' scale in three dimensions of basic trust, generalized trust and system trust. Basic trust includes two secondary dimensions of necessary trust and internal trust. Generalized trust encompasses four secondary dimensions of trust in age groups, educational groups, ethnic groups and religious groups, and system trust includes two secondary dimensions of institutional trust and civic trust.

The measurement of the amount of sense of social solidarity sense has been conducted based on

the adjusted scale of Fessler in six dimensions of community spirit, inter-personal relationships, family and community, mosque, economic behavior and local council. The measure has been translated by a professional English language editor into Persian in concurrent with medical sociology terminologies.

Dependent variable

The dependent variable in this study is the state of affliction and no affliction to the considered types of cancer. Cancer and its considered types are confirmed citing from the results of medical experiments in patients' folders for recognizing the cause of the disease among a group of people and to determine the causal relationships.

Statistical analysis

Data obtained from implementing structured questionnaires have been analyzed using SPSS

statistical analysis software (19.0 Version) and discriminant analysis, canonical correlation analysis and logistic regression analysis. Logistic regression is used to allow us to see the relationship between social capital and health inequality. Adjusted odds ratios and 95% confidence intervals are reported.

Results

Baseline characteristics of participants are shown in Table 1. According to the results of Table 1, altogether, the mean social participation of those afflicted to stomach, colon and breast cancers are less than not-afflicted ones. The mean social trust of those afflicted by breast cancer is less than not-afflicted ones. The mean social solidarity sense in those afflicted to stomach, colon and breast cancers is less than not-afflicted ones.

Table 1: Descriptive statistics (mean scores and standard deviations) for dimensions of social capital

	Mean	SD	Mean	SD
Stomach cancer				
Social participation	30.14	4.18	31.53	7.52
Willingness to ESP	12.07	1.92	12.92	2.03
Willingness to ACISP	3.03	1.26	4.39	2.11
Participation in control	5.07	1.92	4.14	2.47
Participation in implementation	7.10	2.34	6.89	2.23
Participation in decision making	2.85	1.11	3.17	1.88
Social trust				
Basic trust	14.39	2.28	14.57	2.76
Generalized trust	25.25	7.53	22.46	4.97
System trust	28.46	5.10	29.42	4.56
Sense of social solidarity				
Community spirit	7.89	2.14	8.14	1.48
Interpersonal relationship	7.25	2.82	8.00	1.96
Family and community	7.53	1.40	6.46	1.81
Mosque	9.17	2.51	9.35	2.94
Economical behavior	8.03	2.76	9.10	2.26
Local council	7.75	3.18	8.25	2.39
Colon cancer				
Social participation	29.58	4.95	31.32	6.55
Willingness to ESP	12.22	2.01	12.96	1.87
Willingness to ACISP	3.06	1.50	4.00	1.84
Participation in control	4.93	2.06	4.45	1.85
Participation in implementation	6.74	2.51	6.90	2.70
Participation in decision making	2.61	1.05	3.00	1.50

Table 1: Cond....

Social trust	67.25	9.75	66.64	7.87
Basic trust	14.32	2.27	14.54	2.87
Generalized trust	24.74	7.15	22.48	6.69
System trust	28.19	4.67	29.61	4.81
Sense of social solidarity	47.61	1.08	49.09	9.78
Community spirit	8.00	2.14	8.35	2.04
Interpersonal relationship	6.96	2.99	6.61	2.41
Family and community	7.48	1.48	6.83	1.61
Mosque	9.16	2.47	9.25	2.46
Economical behavior	8.22	3.15	9.00	2.16
Local council	7.77	3.46	9.03	3.16
Breast cancer				
Social participation	27.57	4.83	30.53	5.26
Willingness to ESP	11.10	2.46	13.08	1.77
Willingness to ACISP	3.80	1.82	4.04	1.62
Participation in control	4.17	1.63	4.87	2.55
Participation in implementation	5.21	1.96	5.23	2.43
Participation in decision making	3.27	1.95	3.29	2.07
Social trust	62.53	6.64	65.40	1.01
Basic trust	14.02	1.78	14.02	3.16
Generalized trust	21.14	5.83	21.45	4.95
System trust	27.36	4.43	29.95	5.74
Sense of social solidarity	43.61	9.92	46.51	9.74
Community spirit	7.19	2.00	7.87	1.90
Interpersonal relationship	6.68	2.62	6.48	2.42
Family and community	6.97	1.71	6.89	1.86
Mosque	8.17	2.48	8.46	2.48
Economical behavior	7.87	2.24	8.25	2.67
Social council	6.72	3.57	8.53	3.00

Notes: All estimates are weighted to be representative of the Iranian population.

According to Table 2, there is a low correlation between the set of dimensions of social capital and stomach cancer, and social trust has the highest effect in explaining the difference between the two groups of afflicted and not-afflicted people. There is a low correlation between the set of dimensions of social capital and colon cancer, and social participation has the highest effect in explaining the difference between the two groups. There is an average correlation between the set of dimensions of social capital and breast cancer, and social participation has the highest effect in explaining the difference between the two groups. The effect and correlation of social capital dimensions are not significant with any of stomach and colon cancers, but the effect and correlation of

social capital dimensions are significant with breast cancer. 0.182 of breast cancer variance is explained by social capital dimensions.

The results of the logistic regression used to calculate the dimensions of social capital scores (Table 3) indicate that the effect and association of social capital are not significant with any of stomach and colon cancers.

The effect and association of social trust are not significant with any of stomach, colon and breast cancers.

However, the effect and association of social participation with breast cancer is significant and positive. Therefore, Logit Model is as below:

The optimal logistic regression equation = $-8.442 + 0.144$ (social participation)

Table 2: Results of Canonical correlation, discriminant coefficient and logistic regression analysis for dimensions of social capital

Dimensions of social capital	Discriminant coefficient	Canonical correlation	Chi-square	P-value	Nagelkerke R Square
Stomach cancer		0.195	2.181	0.535	0.051
Social participation	0.568				
Social trust	-0.738				
Sense of social solidarity	0.681				
Colon cancer		0.169	1.791	0.617	0.038
Social participation	0.832				
Social trust	-0.288				
Sense of social solidarity	0.471				
Breast cancer		0.366	13.774	0.003**	0.182
Social participation	0.885				
Social trust	0.465				
Sense of social solidarity	0.369				

Notes: *P-value <0.05; **P-value <0.01

Table 3: Results of Wald test and logistic regression analysis for dimensions of social capital

Dimensions of Social capital	Constant	B	Wald	P-value	Odds ratio
Stomach cancer	-0.426				
Social participation		0.038	0.657	0.418	1.038
Social trust		-0.033	0.987	0.320	0.967
Sense of social solidarity		0.031	0.852	0.356	1.031
Colon cancer	-1.530				
Social participation		0.050	1.666	0.280	1.051
Social trust		-0.011	0.125	0.723	0.989
Sense of social solidarity		0.016	0.335	0.563	1.016
Breast cancer	-8.442				
Social participation		0.144	8.595	0.003**	1.155
Social trust		0.045	2.499	0.114	1.046
Sense of social solidarity		0.031	1.588	0.208	1.031

Notes: *P-value <0.05; **P-value <0.01

Discussion

The key to understand the position of the dimensions of social capital in the discourse of public health is to recognize that people are simultaneously mental, social, and economic beings. Although they share a wide range of different histories and experiences, they also possess personal history and special experiences.

Social intervention to decrease affliction to cancer can be more effectively implemented and developed through an interdisciplinary approach. Such an approach seeks to discover social, behavioral, environmental and biological causes of cancer simultaneously.

Considering the positive effects of social capital dimensions, and also the negative effects of social capital dimensions, especially the effects of dimensions of the sense of social solidarity in cancer affliction, it is possible to mention the "dark sides" of social capital (35) besides the positive effects of social capital (36). Based on the arguments, the issue of health inequalities and what is regarded as "health gap" relates to the degree of individuals' possession of social capital. Social capital return is a tool to maintain resources and to defend against loss of resources and to preserve physical functioning ability and immunity from diseases. The social structure of networks increases the probability of mobilizing the others with the

common resources and interests to defend and support emotional resources. The engagement of individuals in different social networks provides supportive resources. Social capital, either directly through maintaining the available resources or indirectly through social support, influences the maintenance of the resources.

Social capital facilitates access to individuals who are regarded as resources to confront stressful factors and makes stress less likely to cause harmful bodily reactions such as unhealthy habits or chronic strenuous physiological excitement. Stress, especially intensive stress can make the individual to do a behavior which is dangerous for his or her health. It is possible that in an attempt to adapt to stress, the individual behaves in a way that, although is effective for a short time, is not healthy at all; behaviors such as smoking, heavy drinking, or eating high-fat sugary diets. In these circumstances, stress is not only harmful physically and mentally, but also it follows some of these harmful strategies to encounter the disease.

In spite of the stress that the individual has, social support may provide the person with a more positive attitude towards life and also higher self-esteem. These positive outcomes may be manifested as a further resistance against diseases or dealing with preventive and more useful healthy habits. Social support that acts as a cushion against negative consequences of stress for health is an important factor that can help the patient in coping with his / her stress. By counteracting or minimizing the primary harms of potentially stressful events, social support can make them less risky or with no risks. Social support is a major factor in reducing chronic stresses and preventing neuroendocrine system from becoming active and facing its negative consequences. Stress is most likely to have direct effects on body systems. Suffering from stress would result in a general model of abnormal hormone production.

Stress stimulates adrenalin system and results in the well-known "fight or flight" response. In this response, adrenal hormones such as adrenalin and noradrenalin are secreted and the fat and glucose level increases due to the preparation of body's metabolic systems. If this continues to be inten-

sive or lengthy, the body will suffer a lot of pressure. The accumulation of pressures on body and fluctuations of physiological responses which are colloquially called Allostatic Load result in sickness and make resources and energy inaccessible to important health-maintaining physiological processes (37).

Stress gradually affects body immune system and disrupts body defense system against antigens whose results can cause cancerous cells to grow in body because the defense system becomes weak against these cells' proliferation. Stress is the initiator of cancer. Intensive stresses can be effective in affliction to cancer. Long-lasting and chronic stresses are also effective in affliction to this type of disease. Harmful strategies to encounter stress, such as drinking and other unhealthy behaviors can interfere with the function of body immune system. Since stress results in dysfunction in body's immune system, and the immune system itself tackles cancer, stress by such a mechanism results in affliction to cancer and the issue of disruption in body's immune system is the beginning of affliction with cancer.

Moreover, since the causal arguments observing social phenomena indicate that the mechanisms connecting the cause and effect are typically rooted in individuals' conscious and meaningful behavior, and social phenomena based on the individuals whose behaviors are the product of wise assessments and sometimes unwise and careless psychological processes, and in other words, social causality depends on individual agency (38), the people with exactly identical social capital in life in the face of stress may experience unhealthy behaviors related to cancer in many different ways. In an attempt to cope with stress, one may resort to unhealthy behaviors such as smoking, drinking alcohol, but the other avoids such behaviors. Therefore, many social factors can change or completely eliminate the negative effects of stress and prevent some of its effects that may cause affliction to cancer (39-41). According to the arguments, social capital can play a role in affliction to cancer, but on the other side of health inequalities, there are some other contributing factors and determinants. Although the simple and quick

reduction of health inequalities is not possible, reducing health inequalities and meeting the human needs will be a step to solve the issue of social injustice. The role of social capital in explaining health and illness encompasses implicit concepts of social policy (42).

Conclusion

Cancer cannot merely be recognized based on its direct, behavioral / psychological and biologic factors, rather it is also necessary to recognize the social contexts. The individuals with exactly similar social capital in their life may experience stress in different ways. One may get paralyzed physically and mentally, and the other may pay a little attention to the event with no concern about it. Thus a specific feature of a stressful social determinant is not a reliable criterion to determine the degree of stress and the extent of its effect on affliction to cancer. Although sociological explanation of the role of social capital in affliction to cancer based on the generally accepted criteria for scientific evaluations are confirmed, it is not the only correct or complete explanation. It can only be said that it is a part of every type of general explanations. Most of theoreticians and physicians agree that there is no single explanation for all causes of health and illness. The increase or decrease in enjoying each dimension of social capital, as a part of social policies, can lead to a change in the number of people suffering from cancer. On the individual level, applying a planned behavior model can provide a framework for making decisions about demonstrating or not demonstrating healthy behaviors in the face of stress.

Ethical considerations

Ethical issues including misconduct (plagiarism, fabrication and falsification), submission, and redundancy have been completely observed by the authors. Anonymity, confidentiality, informed consent, safety and privacy of respondents are considered as the ethical consideration of the research.

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References

1. Bradby Hannah (2008). *Medical sociology: An introduction*. Sage, London, pp. 70-83.
2. Marmot Michael G (2005). Social determinants of health inequalities. *Lancet*, 365: 1099-104.
3. Backwith Dave, Mantle Greg (2009). Inequalities in health and community-oriented social work: Lessons from Cuba. *Int Soc Work*, 52: 499-511.
4. McKenzie K, Whitley R, Weich S (2002). Social capital and mental health. *Br J Psychiatry*, 181: 280-283.
5. Ziersch AM (2005). Health implication of access to social capital: Finding from an Australia study. *Soc Sci Med*, 61: 2119-2131.
6. Armstrong David, Tavakol Mohamad (2008). *Medical sociology*, 2nd ed, Shahid Beheshti University of Medical Sciences, Tehran, pp. 112-113.
7. White Kevin (2012). *An introduction to the sociology of health and illness*, 2nd ed, Trans. Naserirad, Shahid Beheshti University of Medical Sciences, Tehran, pp. 102-110.
8. Coleman JS (1990). *Foundations of social theory*, Harvard University Press, Cambridge, pp. 32-69.
9. Putnam RD (1993). *Making democracy work. Civic traditions in modern Italy*, Princeton University Press, Princeton, pp. 65-104.
10. Kawachi I, Kennedy BP, Lochner K, Prothrow-Stith D (1997). Social capital, income inequality and mortality. *Am J Public Health*, 87(9): 1491.
11. Islam MK, Merlo J, Kawachi I, Lindstrom M, Gerdtham UG (2006). Social capital and health: does egalitarianism matter? A literature review. *Int J Equity Health*, 5(1): 3.
12. Lomas J (1998). Social capital and health: Implications for public health and epidemiology. *So Sci Med*, 47: 1181-1188.
13. Sampson, RJ, Raudenbush SW, Earls F. (1997). Neighbourhoods and violent crime: A multilevel study of collective efficacy. *Science*, 277: 918-924.

14. Prentice, JC (2006). Neighbourhood effects on primary care access in Los Angeles. *Soc Sci Med*, 62: 1291–1303.
15. Crosby RA, Holtgrave DR, DiClemente RJ, Wingood GM, Gayle JA (2003). Social capital as a predictor of adolescents' sexual risk behaviour: A state-level exploratory study. *AIDS Behav*, 7: 245–252.
16. Holtgrave, DR, Crosby, RA (2004). Social determinants of tuberculosis case rates in the United States. *Am J Prev Med*, 26: 159–162.
17. Boneham MA, Sixsmith JA (2006). The voices of older women in a disadvantaged community: Issues of health and social capital. *Soc Sci Med*, 62: 269–279.
18. DiMatteo MR (2008). *The psychology of health*, Trans. Musaviasl, Salaryfar, Azarbajejani, Abbasi, Samt Publication, Tehran, pp. 78-112.
19. Rose P, Yates P (2001). Quality of life experienced by patients receiving radiation treatment for cancers of the head and neck. *Cancer Nurs*, 24(4): 255-63.
20. Northouse LL, Caffey M, Deichelbohrer L, Schmidt L, Guziatek-Trojniak L, West S (1999). The quality of life of African American women with breast cancer. *Res Nurs Health*, 22(6): 449-60.
21. Quatman T, Watson CM (2001). Gender differences in adolescent self-esteem: An exploration of domains. *J Genet Psychol*, 162(1): 93-117.
22. Corner J, Baily C (2001). *Cancer Nursing: Care in Context*, Black Well Publishing, UK, p. 64.
23. Parkin M D, Bray, F, Ferlay, J, Pisani, P (2005). Global cancer statistics 2002. CA. *Cancer J Clin*, 55: 74-108.
24. Kamangar F, Dores, GM, Anderson WF (2006). Patterns of cancer incidence, mortality, and prevalence across five continents: Defining priorities to reduce cancer disparities in different geographic regions of the world. *J Clin Oncol*, 24: 2137-2150.
25. Malekzadeh Reza, Semnani Shahriar, Sajadi Seyedalireza (2008). Esophageal cancer in Iran. *Govaresh*, 13 (1): 25-34.
26. Malekzadeh Reza, Riahi Ayna, Sajadi Seyedalireza (2008). Gastric cancer in Iran. *Govaresh*, 13 (2): 107-112.
27. Scambler Graham (2005). *Medical sociology: Social structures and health*, Routledge, London, p. 221.
28. Hiatt Robert A (2008). The social determinants of cancer: A challenge for transdisciplinary science. *Am J Prev Med*, 35 (2S): 141-150.
29. Marmot Michael G (1998). Improvement of social environment to improve health. *Lancet*, 351: 57–60.
30. Lillbacka R (2006). Measuring social capital: Assessing construct stability of various operationalizations of social capital. *Acta Sociolo*, 49: 201–220.
31. Ferlander Sara (2007). The importance of different forms of social capital for health. *Acta Sociolo*, 50 (115): 115-128.
32. Field John. (2008). *Social capital*, 2nd ed, Routledge, London, p. 29.
33. Krishna Anirudh (2005). Measurement of social capital. In: *Social capital: Trust, democracy and development*, Kian Tajbakhsh, Trans. Khakbaz and Pouyam, Shirazeh, Tehran, p. 66.
34. Berry HL, Rickwood DJ (2000). Measuring social capital at the individual level: Personal social capital, values and psychological distress. *Int J Mental Health Promotion*, 2 (3): 35–44.
35. Zmerli Sonja (2010). Social capital and norms of citizenship: An ambiguous relationship? *Am Behav Sci*, 53 (5): 657-678.
36. Albano Roberto, Barbera Filippo (2010). Social capital, welfare state, and political legitimacy. *Am Behav Sci*, 53 (5): 677-690.
37. Wilkinson R, Marmot M (1998). *Social determinants of health: The solid facts*. World Health Organization. Oxford University Press, Oxford, pp. 28-99.
38. Little Daniel (2007). *Varieties of social explanation: An introduction to the philosophy of social science*, Trans. Abdolkarim Soroosh, Cultural Institute of Serat, Tehran, p. 42.
39. Tavakol M, Naserirad M (2011). Relationship between social participation and cancer among patients in Cancer Institute of Tehran. *Hakim Res J*, 14(3): 137- 143.
40. Tavakol M, Naserirad M (2011). Comparison of the social solidarity in persons affected by cancer and persons not-affected by cancer. *Pajesh Health Monit*, 1(41): 137- 143.
41. Tavakol M, Naserirad M (2010). Health inequality, cancer and social trust. *Journal of Teb Tazkeijeh*, 76: 19- 29.
42. Tausig Mark, Michello Janet, Subedi Sree (2003). *Sociology of mental illness*, 2nd ed, Prentice Hall, New Jersey, p.167.