

The Risk of Colorectal and Other Types of Cancers in Diabetic Patients: A Systematic Review

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ABSTRACT

Introduction: In particular, epidemiological evidence suggests that Increased Type 2 Diabetes is associated with an increased risk of certain specific cancers such as breast cancer, colorectal cancer, liver cancer and pancreatic cancer. Our goal of this systematic review study is to understand the relationship between diabetes and cancer. So this study was done with the goal of determining the risk of colorectal and other types of cancers in diabetic patients.

Materials and Methods: This study is a systematic review that in order to achieve the goal of the study and to improve the accuracy of its study and its comprehension, this integrated overview studies were conducted based on the Broome method. Searching for articles in search engines, authoritative sites and databases Google Scholar, Research gate, Science direct, PubMed, Springer in Persian and English. In the first stage, 39 articles were found. Of these, 10 related articles that have been published over the past 27 years have been reviewed.

Results: In several studies, there was a relationship between different types of cancer and diabetes. One study, conducted by SU luo et al was done, in which 29 metrics including 10 case studies and 19 group studies were included in this meta-analysis. In a combined analysis of all studies, diabetes mellitus was associated with an increased risk of colorectal neoplasm. The risk of colorectal cancer also increased significantly.

Conclusion: In studies that were conducted and reviewed by us, the relationship between diabetes and colorectal cancer and also other types of cancer was quite serious. it is better be done to plan the Ministry of Health in Iran and the World Health Organization to reduce diabetes and cancer.

Keywords: colorectal Cancer, Risk Factor, Type 2 diabetes, Cancer

INTRODUCTION

Cancer is the second most common cause of death in worldwide and in developed countries. And is the third cause of death in less developed countries (1). According to World Health Organization statistics, the incidence of cancer deaths from 45% per year 2007 will reach 65% in 2030 (2). In particular, epidemiological evidence suggests that increased diabetes is associated with an increased risk of certain specific cancers such as colorectal cancer, liver cancer and pancreatic cancer (3). Diabetes is a chronic and genetically heterogeneous disease that is characterized by an increase in blood glucose levels (4-9). Diabetes is also a potential

disabling disorder affecting more than 300 million people worldwide, has become the fastest chronic disease in the world and a major cause of morbidity and mortality in the industrialized world (10-16).

Due to the long and dangerous effects of that day, more attention is paid (17). For example, one of the complications of diabetes among diabetic patients is depression that is one of the most common psychiatric disorders (18). Depression is one of the most common and debilitating mental illnesses for individuals (19-21). Depression and occupational stress daily can cause some health disorders (22). Diabetes causes many problems in thalassemic patients

(23). Thalassemia is a hereditary illness that causes many problems in people with this disease (24-28). Diabetics are more likely to develop a variety of cancers. Multiple conflicting factors are directly related to clinical diagnoses of diabetes at various levels of metabolic control, duration of diabetes and the presence of complications or association with diseases (29-35). Therefore, it is difficult to assess the risk of developing cancer in diabetes. In recent years, there has been a large number of evidence suggesting a significant increase in the incidence of cancer in diabetic patients (36).

The pattern of occurrence of different types of cancer varies among different populations it is related to factors such as occupational, social, cultural and racial (possibly inheritance), geographic and nutritional issues (37). In particular, epidemiological evidence suggests that Increased Type 2 Diabetes is associated with an increased risk of certain specific cancers such as breast cancer, colorectal cancer, liver cancer and pancreatic cancer (38). Our goal of this systematic review study is to understand the relationship between diabetes and cancer. So this study was done with the goal of determining the risk of colorectal and other types of cancers in diabetic patients.

MATERIALS AND METHODS

Our intention to carry out this systematic review, as mentioned above, is to understand the connection between diabetes and various types of cancer. In this study, the standard Broome method was used to analyze the studies.

In order to achieve the goal of the study and to improve the accuracy of its study and its comprehension, this integrated overview study was conducted based on the Broome method. This method is performed in three steps: searching for texts, evaluating data and analyzing data. So that in the search phase of post-retrospective study texts, four stages are considered in terms of inclusion criteria. After reviewing the content of the study, the content of the study is evaluated and at the end of the data analysis.

This study is a systematic overview that using articles published in the last 30 years about the risk of colorectal and other types of cancers in diabetic patients. Searching for articles in search engines, authoritative sites and databases Google Scholar, Research gate, Science direct, Pub Med, Springer in Persian and English. In the first stage, 39 articles were found. Of these,

10 related articles that have been published over the past 27 years have been reviewed.

Studies in the field of research were written in English or Persian, access to their full text was possible and published during the last 27 years and unnamed studies were deleted without history and non-academic. To achieve relevant studies, a wide range of keywords including colorectal Cancer, Risk Factor, Type 2 diabetes, and cancer in the form of single-track and combination search, and using the method "And and OR "were used.

RESULTS

Endogenous hyperinsulinemia in type 2 diabetes is potentially associated with an increased risk of colorectal cancer (39). Also various studies have been conducted on the relationship between these two diseases. Several mechanisms have been proposed to justify the association between the history of diabetes and the risk of colorectal cancer. One theory is this that hormones play a role in the development of colon cancer. In people with diabetes, insulin hormones and others hormones, such as insulin-like growth factors, are high. These hormones cause the growth and development of cells and can also cause cancer cells to grow (40).

A study showed a significant relationship between type 2 diabetes and colon adenomas. Exposure to insulin and thiazolidinedione's were associated with the formation of adenomas. None of the analgesic drugs and HbA1c levels was predictive of adenoma. Cigarette smoking Aspirin and statics increase the risk of developing adenoma (41).

Also in a study, it has shown that diabetes can increase the chances of developing colorectal cancer. The final analysis, in the presence of other effective factors, showed that diabetes may increase the chances of developing colorectal cancer. In this study, after identifying the age and sex, and controlling the confounding variables the history of diabetes is increasing the chance of developing colorectal cancer. In fact, this study showed that the risk of colorectal cancer is high in people with diabetes (42).

In a study in men, the risk of total cancer has increased by 27 percent in those with a history of diabetes. In this study, we also saw an increased risk of colon cancer and gastric cancer with borderline significance. In women, the incidence of cancer was significantly increased at the borderline, while the incidence of gastric cancer and liver cancer was statistically

significant and the incidence of ovarian cancer was observed at the border (43).

The relationship between diabetes and primary liver cancer in a case-control study was confirmed by histology in 428 cases of cancer carcinoma incident, 59 cases of gallbladder and bile ducts, and 1502 controls in the hospital for non-acute diseases. Sixty-four cases of hepatocellular carcinoma have been reported in 87 diabetic patients (44).

In a study, the authors conducted several major questions on the potential link between diabetes and various types of cancer in a disease-control project. The link between diabetes and any of the 12 types of cancer was estimated. The risk of developing pancreatic and liver cancers among diabetic patients has increased. The increased risk of pancreatic cancer is fully affected by people with diabetes. It was probably a reverse causation demonstration. Conversely, an increased risk of liver cancer was independent of the distance between diabetes and the diagnosis of cancer. As a result, diabetes was associated with an increased risk of developing liver cancer among men, but no other cancers, including pancreatic cancer, were seen (45).

Also in a study, there was no statistically significant relationship between diabetes and billiard, esophageal and stomach cancers. Diabetes was associated with an increased risk of developing liver, pancreatic, colon, and rectal cancers. The severity of diabetes, due to the length of time or the need for drug therapy, seemed to have a stronger association with the risk of developing liver, pancreatic and rectal cancers, but it did not have colon cancer (46).

In a study, in which 29 metrics including 10 case studies and 19 group studies were included in this meta-analysis. In a combined analysis of all studies, diabetes mellitus was associated with an increased risk of colorectal neoplasm. The risk of colorectal cancer also increased significantly (47).

In a study that was done, the incidence of colorectal cancer in diabetic patients was 2.1 times higher than non-diabetic controls (48). In a study, the odds of having colorectal cancer in diabetic patients were 1.23 times higher (49).

In a study that was performed and findings from this meta-analysis showed that diabetes is associated with an increased risk of breast cancer. Analysis of all 20 studies studied in this study. Showed that women with diabetes (versus

diabetics) had an increased risk of developing breast cancer by 20% (50).

DISCUSSION

According to World Health Organization statistics, the incidence of cancer deaths from 45% per year 2007 will reach 65% in 2030 (2). In particular, epidemiological evidence suggests that increased diabetes is associated with an increased risk of certain specific cancers such as colorectal cancer, liver cancer and pancreatic cancer (3). Our goal of this systematic review study is to understand the relationship between diabetes and cancer. So this study was done with the goal of determining the risk of colorectal and other types of cancers in diabetic patients.

The findings of these studies in various studies have shown that type 1 diabetes increases the risk of colorectal cancer (42, 43), (47, 49). Research shows that people with diabetes are at increased risk for colon cancer than non-diabetic people. But it is not clear what the cause of this connection is and what should be done to prevent colon cancer in people with diabetes. Also, the risk of colon cancer in diabetics is higher than that of healthy people. The risk of rectal cancer in people with diabetes is higher than other people. Although this increase seems to be limited to men only.

Various studies have shown that diabetes is associated with colorectal cancer, however, its causative-causative aspects are difficult to diagnose because of the complexity of diabetes. But some of the things that happen in diabetes can cause colon cancer. One theory is that they interfere with the large intestinal cancers of the hormones. In people with diabetes, there is a high level of insulin hormones and hormones called insulin-like growth factors. These hormones cause the growth and development of cells and can also cause cancer cells to grow. This association is associated with any mechanism involved in it, as long as diabetes is associated with colon cancer; its subsequent implications are still unclear. Also, according to some studies in men, the risk of cancer in people with diabetes has increased by more than 27%. Some studies have also shown that diabetes is associated with an increased risk of breast cancer (33). Lifestyle changes can reduce the risk of breast cancer. One of the factors that people with breast cancer are at risk for diabetes is estrogen resistance in the chemotherapy phase. Using some medications such as glucocorticoid in chemotherapy can increase your blood glucose; these drugs are used to

prevent inflammation and nausea. When the body has insulin resistance, it is exposed to the spread of diabetes and the types of cancers that may occur in people with breast cancer. Also, in people with diabetes, breast enhancement increases the risk of breast cancer by increasing insulin levels. The statistics show that people with advanced breast cancer are on the rise and while they have diabetes, they have larger tumors than other breast cancer patients and in these people, the likelihood of developing the disease in diabetes is also higher. Studies have shown that diabetes also increases the risk of developing liver cancer (46). Also, people with diabetes with cirrhosis and hepatitis also increase the risk of developing hepatocellular carcinoma. Especially hepatitis C is very important. Type 2 diabetes is associated with an increased risk of developing liver, pancreatic, and intestinal and rectal cancers in postmenopausal women. The severity of diabetes may increase the risk of pancreatic cancer, liver and rectum.

CONCLUSION

New research shows that people with diabetes are more at risk for colon cancer than non-diabetics, but the reasons for this connection and what to do to prevent colon cancer in diabetics is still unclear. To people at risk, such as those with inflammatory bowel disease (colitis or Crohn's disease) or have a family history of cancer, screening at lower ages is recommended.

In studies that were conducted and reviewed by us, the relationship between diabetes and colorectal cancer and also other types of cancer was quite serious. It is better being done to plan the Ministry of Health in Iran and the World Health Organization to reduce diabetes and cancer.

ACKNOWLEDGMENT

The authors are grateful to all those who cooperate with us.

REFERENCES

- [1] Sabatino SA, Lawrence B, Elder R, Mercer SL, Wilson KM, DeVinney B, et al. Effectiveness of interventions to increase screening for breast, cervical, and colorectal cancers: nine updated systematic reviews for the guide to community preventive services. *Am J Prev Med.* 2012; 43(1): 97-118.
- [2] Is the number of cancer cases increasing or decreasing in the world? [Online]. 2008 [cited 2008 Apr 1]; Available from: URL: <http://www.who.int/features/qa/15/en/index.html>
- [3] Sona MF, Myung SK, Park K, Jargalsaikhan G. Type 1 diabetes mellitus and risk of cancer: a meta-analysis of observational studies. *Japanese journal of clinical oncology.* 2018 Apr 9; 48(5):426-33.
- [4] Madmoli M, Eilami O, Rezaie K, Aliabad MA, Moslemirad M. Diabetes and the risk of suffering cardiovascular Diseases: A two-year retrospective study. *International Journal of Ecosystems and Ecology Science (IJEES).* 2018 Jun; 8(3): 649-56.
- [5] Madmoli M Rostami F, Mirsami Yazdi N, Mosavi A, Baraz Sh. Evaluation of Prevalence of Diabetic Foot Ulcer and Its Related Factors in Diabetic Patients Admitted to KHatam-ol-Anbia Hospital in Shoushtar During 2015-2016: A Retrospective Study. *International Journal of Ecosystems and Ecology Science (IJEES).* 2018 June; 8 (3): 545-52.
- [6] Moslemirad M, Madmoli M, Madmoli Y, Niksefat M. Prevalence of type 1 and type 2 diabetes and its related factors in diabetic patients hospitalized in Khatam-ol-Anbia hospital in Shoushtar, 2014-15: A retrospective study. *Journal of Research in Medical and Dental Science.* 2018 May 22; 6(3):421-6.
- [7] Rostami F, Madmoli M, Mirsami Yazdi N, Baraz Sh. Evaluation of The Prevalence of Lower Limb Amputation and Its Related Factors in Diabetic Patients Admitted to KHatam-ol-Anbia Hospital in Shoushtar During The 2015-2016: A Retrospective Study. *International Journal of Ecosystems and Ecology Science (IJEES).* 2018 June; 8 (3): 553-60.
- [8] Raisifar Z, Afshar Nia A, Madmoli M, Madmoli Y. The Relationship between Using Insulin and Suffering Alzheimer's disease in Patients with Diabetes: A Two-Year Study. *International Journal of Ecosystems and Ecology Science (IJEES).* 2018 June; 8 (3): 623-28.
- [9] Shirali M, Madmoli Y, Roohafza J, Karimi H, Baboli Bahmaei A, Ertebati S. Improvement diagnosis of diabetes using a combination of sugeno fuzzy inference systems and firefly algorithms. *ijdd.* 2017; 15 (3): 172-176. [In persian].
- [10] Raisifar Z, Afshar Nia A, Maghamesi Moarrefi H, Madmoli M. Evaluation of Gi Bleeding Prevalence and Its Related Factors in Diabetic Patients Hospitalized in KHatam-ol-Anbia Hospital During 2015-16: A Retrospective Study. *International Journal of Ecosystems and Ecology Science (IJEES).* 2018 June; 8 (3): 609-14.
- [11] Mostafa Madmoli, Zahra Kord, Azita Bandani, Negin Sedighi, Mahla Rezaei Shandiz, Pouriya Darabiyani, Alieh AfsharNia. Epidemiological and clinical study of patients with Alzheimer's

- in Five Cities of Khuzestan Province in 2016-2018. *Medical Science*, 2019; 23(95), 1-5
- [12] Hadi Mashali, Fatemeh Toleideh, Rezvan Rahmani, Pouriya Darabiyan, Mostafa Madmoli. The predictive role of hyper lipidemia in the incidence of ACS in patients referring to Shahidzadeh Hospital in Behbahan in 2016 - 2017. *Medical Science*, 2018; 22(94), 566-570
- [13] Mostafa Madmoli, Yasaman Modheji, Alireza Rafi, Rezvan Feyzi, Pouriya Darabiyan, Alieh AfsharNia. Diabetes and its predictive role in the incidence of Alzheimer's disease. *Medical Science*, 2019; 23(95), 30-34
- [14] Mostafa Madmoli, Mehdi Fallah bagher shaidaei, Akram Rohani, Pouriya Darabiyan, Fariba Mobarez. The correlation between alcohol consumption and reducing the age of cancer incidence in patients with this disease. *Medical Science*, 2019, 23(95), 48-53
- [15] Mostafa Madmoli, Zahra Mahmoudi Dehches hmeh, Alireza Rafi, Zahra Kord, Fariba Mobarez, Pouriya Darabiyan. The rate of some complications and risk factors of diabetes in diabetic patients: Study on cases of 3218 diabetic patients. *Medical Science*, 2019; 23(95), 63-68
- [16] Mostafa Madmoli, Mehran Yarbig, Negin Sedighi, Pouriya Darabiyan, Fariba Mobarez. Communication between body mass index and the risk of obesity-related cancer: A 5-year study on patients with cancer. *Medical Science*, 2019; 23(95), 69-74.
- [17] Jan AW, Hanifullah Khan D, Ishtiaq Ahmad D, Khan M. DIABETIC FOOT ULCER. *Diabetes*. 2016; 26:05
- [18] Larijani B, Khoramshahee M, Bandarian F, Akhondzadeh S. Association of depression and diabetes in the doctor Shariati diabetes clinic and Iranian Diabetes Association. *Iranian Journal of Diabetes and Metabolism*. 2004 May 15; 3(1):77-82.
- [19] Madmoli Y, Madmoli M, Qashqaei nezhad N, Bosak S. Prevalence of depression and associated factors in adolescents of masjed soleyman. *JPEN*. 2016; 2(4):31-40.
- [20] Smith TB, McCullough ME, Poll J. Religiousness and depression: evidence for a main effect and the moderating influence of stressful life events. *Psychological bulletin*. 2003 Jul; 129(4):614.
- [21] Roughani A, Madmoli M, Raisifar Z, Kikhavani S, Yasemi M, Azami M, Sharifi Z. The prevalence of behavioral disorders and its related factors in elementary school children in Ilam City in 2011–2012. *Indian Journal of Forensic Medicine & Toxicology*. 2018; 12(4): 165-9.
- [22] Madmoli M, Nikpay S. An Investigation of the Relationship between Spiritual Health and Depression, Anxiety, and Stress among Students of ilam University of Medical Sciences. *Journal of Research in Medical and Dental Science*. 2018 May 17; 6(3):294-300.
- [23] Soriguer F, Goday A, Bosch-Comas A, Bordiú E, Calle-Pascual A, Carmena R, Casamitjana R, Castaño L, Castell C, Catalá M, Delgado E. Prevalence of diabetes mellitus and impaired glucose regulation in Spain: the Di@ bet. es Study. *Diabetologia*. 2012 Jan 1; 55(1):88-93.
- [24] Madmoli Y, Aslani A, Ahmadi Y, Mousavi M, Mashalchi H, Niksefat M, Madmoli M. Study Habits and Related Factors in Students of Nursing and Midwifery College of Dezful University of Medical Sciences in 2015. *Iranian Journal of Nursing Research (IJNR)*. 2017.
- [25] Cappellini MD, Cohen A, Piga A, Bejaoui M, Perrotta S, Agaoglu L, Aydinok Y, Kattamis A, Kilinc Y, Porter J, Capra M. A phase 3 study of deferasirox (ICL670), a once-daily oral iron chelator, in patients with β -thalassemia. *Blood*. 2006 May 1; 107(9):3455-62.
- [26] Maraghi E, Adavi A, Madmoli Y, Heidari-Soureshjani R, Madmoli M. The Effect of Orem Self-Care on Mental Health of Patients with Thalassemia Major. *Journal of Clinical Nursing and Midwifery*. 2018; 4(3).
- [27] Madmoli M, Madmoli Y, Rahmati P, Adavi A, Yousefi N, Gheisari Z, Abbaszade Aliabad M. Quality of Life and Some Related Factors in Patients with Beta Thalassemia Major in Southwest Iran. *Journal of Client-centered Nursing Care (JCCNC)*. 2017; 3(2).
- [28] Madmoli Y, Akhaghi Dezfuli SM, Adavi A, Maraaghi E, Heidari Soureshjani R, Madmoli M. The Effect of Orem Self-Care on Mental Health of Patients with Thalassemia Major. *Journal of Clinical Nursing and Midwifery*. 2018 Jul 1; 7(2):108-15.
- [29] Saeid pour J, Jafari M, Ghazi Asgar M, Dayani Dardashti H, Saeid Pour J [1] / Jafari M [2] / Ghazi Asgar M [3] / Dayani Dardashti E. Effect of educational program on quality of life in diabetic patients. *jha*. 2013; 16 (52):26-36.
- [30] Madmoli M, Karami M, Madmoli Y. Alcohol Abuse and Incidence of Different Types of Cancer: The Serious Risk of Cancer in Alcohol Consumers. *Journal of Research in Medical and Dental Science*. 2019; 7(3): 55-60
- [31] Feyzi R, Madmoli M. Epidemiologic approach to quality of life in diabetic patients: a systematic review study. *IJMBS [Internet]*. 2019; 3(5): 24-28. Available from: <http://www.ijmbs.info/index.php/ijmbs/article/view/226>
- [32] Feyzi R, Madmoli M. A systematic review with the epidemiological approach to the quality of life of cancer patients. *IJMBS [Internet]*. 2019; 3(5): 18-23. Available from: <http://www.ijmbs.info/index.php/ijmbs/article/view/235>

- [33] Madmoli M, Madmoli M, Khodadadi M, Madmoli Y. The communication Between Diabetes and Alzheimer's disease: a study on diabetic patients referring to health centers in three cities of Khuzestan province. *International Research in Medical and Health Science* [Internet]. 22Apr.2019 [cited 22Apr. 2019]; 2(2):8-5. Available from: <http://irmhs.com/index.php/irmhs/article/view/38>.
- [34] Madmoli M, Saeidilandi M, Latifinasab R, Fatehimoghaddam S, Mobarez F, Darabiyan P. Hypertension and Risk of Acute Coronary Syndrome (ACS) in Patients with ACS: A Study on 926 patients with ACS. *International Journal of Ayurvedic Medicine*. 2019 Apr 3; 10(1):22-6.
- [35] Madmoli M, Madmoli Y, Taqvaeinasab H, Khodadadi M, Darabiyan P, Rafi A. Some influential factors on severity of diabetic foot ulcers and Predisposing of limb amputation: A 7-year study on diabetic patients. *International Journal of Ayurvedic Medicine*. 2019 Apr 3; 10(1):75-81.
- [36] Mostafa Madmoli," Evaluation of Chemotherapy Complications in Patients with Cancer: A systematic Review", *International Journal of Research Studies in Science, Engineering and Technology*, vol. 5, no. 12, pp. 59-64, 2018.
- [37] Hamadzadeh S, Ezatti ZH, Abedsaeidi ZH, Nasiri N. Coping Styles and Self-Care Behaviors among Diabetic Patients. *IJN*. 2013; 25 (80):24-33.
- [38] Ramesht M, Pourfarzi F, Entezari M, Karamati H. An Epidemiologic Study of Spatial and Temporal Patterns of Gastric Cancer in Ardabil) Years 2006- 2012. *j.health*. 2015; 6 (3):345-354.
- [39] Habib SL, Rojna M. Diabetes and risk of cancer. *ISRN oncology*. 2013 Feb 7; 2013.
- [40] Renehan AG, Shahet SM. Diabetic, insulin therapy, and colorectal cancer. *British Medical Journal* 2005; 12: 330-551.
- [41] Eddi R, Karki A, Shah A, DeBari VA, De Pasquale JR. Association of type 2 diabetes and colon adenomas. *Journal of gastro intestinal cancer*. 2012 Mar 1; 43(1):87-92.
- [42] Azizi H, Delpisheh A, Sayehmiri K, Asadollahi K, Esmaeili ED, Sharbafi J. Risk of Colorectal Cancer in Type2 Diabetic Patients. *Majallah-i pizishki-i Danishgah-i Ulum-i Pizishki va Khadamat-i Bihdashti-i Darmani-i Tabriz*. 2016 Oct 1; 38(4):56.
- [43] Inoue M, Iwasaki M, Otani T, Sasazuki S, Noda M, Tsugane S. Diabetes mellitus and the risk of cancer: results from a large-scale population-based cohort study in Japan. *Archives of internal medicine*. 2006 Sep 25; 166(17):1871-7.
- [44] La Vecchia C, Negri E, Decarli A, Franceschi S. Diabetes mellitus and the risk of primary liver cancer. *International journal of cancer*. 1997 Oct 9; 73(2):204-7.
- [45] Luo J, Chlebowski R, Liu S, McGlynn KA, Parekh N, White DL, Margolis KL. Diabetes mellitus as a risk factor for gastrointestinal cancers among postmenopausal women. *Cancer Causes & Control*. 2013 Mar 1; 24(3):577-85.
- [46] Rousseau MC, Parent MÉ, Pollak MN, Siemiatycki J. Diabetes mellitus and cancer risk in a population-based case-control study among men from Montreal, Canada. *International journal of cancer*. 2006 Apr 15; 118(8):2105-9.
- [47] Luo S, Li JY, Zhao LN, Yu T, Zhong W, Xia ZS, Shan TD, Ouyang H, Yang HS, Chen QK. Diabetes mellitus increases the risk of colorectal neoplasia: an updated meta-analysis. *Clinics and research in hepatology and gastroenterology*. 2016 Feb 1; 40(1):110-23.
- [48] Wang JY, Chao TT, Lai CC, Wang CY, Wu VC, Wang SM, Lin HI, Tang SH, Lin HW. Risk of colorectal cancer in type 2 diabetic patients: a population-based cohort study. *Japanese journal of clinical oncology*. 2013 Jan 3; 43(3):258-63.
- [49] Bosetti C, Rosato V, Polesel J, Levi F, Talamini R, Montella M, Negri E, Tavani A, Zucchetto A, Franceschi S, Corrao G. Diabetes mellitus and cancer risk in a network of case-control studies. *Nutrition and cancer*. 2012 Jul 1; 64(5):643-51.
- [50] Larsson SC, Mantzoros CS, Wolk A. Diabetes mellitus and risk of breast cancer: a meta-analysis. *International journal of cancer*. 2007 Aug 15; 121(4):856-62.

Citation: Mohammad Madmoli, Mahboobe Khodadadi, Hadi Kianirad". *The Risk of Colorectal and Other Types of Cancers in Diabetic Patients: A Systematic Review*". *Annals of Microbiology and Infectious Diseases* 2(2), 2019, pp.17-22.

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