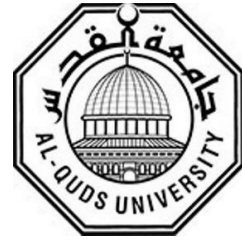


**Deanship of Graduate Studies**

**Al-Quds University**



**Determinants of Colorectal Cancer among Patients Attending  
Biet Jala Governmental Hospital: A Case-control Study**

**Issa Khaled Ghrouz**

**M.Sc. Thesis**

**Jerusalem – Palestine**

**1440 - 2019**

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Governmental Hospital: A Case-control Study**

**Prepared by:  
Issa Khaled Ghrouz**

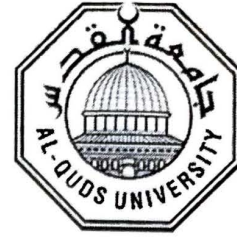
**B.Sc in Medical Laboratory Sciences /Al Quds University/ Palestine**

**Supervisor: Dr. Nuha El Sharif**

**A thesis submitted in partial fulfillment of requirement for the degree of  
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**Jerusalem – Palestine**

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**Thesis approval**

**Determinants of Colorectal Cancer among Patients Attending Biet Jala Governmental  
Hospital: A Case-control Study**

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**Jerusalem – Palestine**

## **Dedication**

I dedicate this work to my dear parents.

To my Grandparents

To my uncle Dr Ibrahim

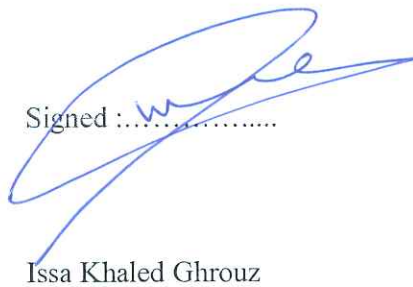
To my beloved wife Aseel

To my brothers and sisters

## DECLARATION

I certify that this thesis submitted for the degree of Master is the result of my own research, except where otherwise acknowledged and that this thesis (or any part of the same) has not been submitted for a higher degree to any other university or institution.

Signed : .....

A handwritten signature in blue ink, appearing to be 'Issa Khaled Ghrouz', written over a dotted line.

Issa Khaled Ghrouz

Date:28/5/2019

## ACKNOWLEDGMENT

الحمد لله رب العالمين الذي وفقني وأعانني على إتمام هذا العمل

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Finally, I owe my deepest gratitude to my wife Aseel for her support, inspiration and patience throughout my master degree pursuing

## **Executive summary**

---

**Background:** In Palestine, colorectal cancer is the second most occurring cancer in following Lung cancer. It accounts for 9.9% of all cancer cases. This percentage is considered high when compared to the surrounding countries.

**Study problem and justification:** There is no screening program for colorectal cancer in Palestine. Also, no study investigated the risk and the protective factors of colorectal cancer. Therefore, we are planning this study to be a baseline study for decision makers to help in planning for a national strategy that can help in preventing this cancer and/or its complications.

**Aim & objectives:** This study aims to identify the determinants of colorectal cancer among patients attending the oncology department at Biet Jala Governmental Hospital. Its objectives are to determine the associations between the various lifestyle aspects, socio-demographic characteristics, family history of malignancy factors, patients' health status, personal or family colon polyps, radiation therapy, and consanguinity with the risk of developing colorectal cancer.

**Study methodology:** The study is a matched case control study. Study cases and control were matched by age and gender. The study consisted of 210 participants (105 cases and 105 controls). Males composed 54% of the study population. Cases were Colorectal cancer patients attending the daycare and the oncology department at Beit Jala governmental hospital. Control were any other patients attending other hospital departments. All controls were tested for fecal occult blood test and all were negative. An interview-based questionnaire structured on the risk factors of colorectal cancer was used for data collection.

**Statistical Analysis:** SPSS version 23 was used for data entry and analysis. Continuous variables were compared between the cases and controls by t test. Chi-square test was used for comparison of categorical variables between the two groups (cases and controls). Conditional logistic regression models were used in the multivariate analysis to generate the odds ratio.

**Ethical Considerations:** this study was submitted to Al Quds University-SPH graduate studies committee. Approval was obtained from the MOH to start the study at the hospital. A consent form was signed by cases and controls who agreed to participate in the study.

**Results:** Analysis of the study cases data showed that the mean age of the participants was  $61 \pm 12$  (mean  $\pm$  SD) years, and the mean age of the cases at diagnosis was 59.5 years old. Of the cases 54% were males, 88.6% were married, 86.3% of were employed, 77.1% lived in the southern region of the West Bank, 63% of the cases lived in cities, and 92.4% of them were colon cancer patients only.

On the other hand, analysis of control group data showed that the mean age of the participants was same as the cases due to the age and gender matching. Of them 90.5% were married, 82.4 % were employed, 97.1% of them live in the southern region of the west bank, and 31.4% of them lived in cities while 62.9% of them lived in villages.

The multivariate analysis showed that living in villages lowers the risk of colorectal cancer by 34%, while living in the southern region of the West Bank increases the risk of colorectal cancer by 12 folds (AOR= 12.439 CI= 2.724 – 56.809). Also, parental consanguinity almost triples the risk of colorectal (AOR=2.887 CI= 1.171- 7.118). Smoking increases the risk of colorectal cancer by 5.5 folds (AOR= 5.503 CI= 1.866- 16.227). Consuming fruits more than two meals a week reduces the risk of colorectal cancer by about 8 folds (AOR= 0.082 CI=0.032-0.206), while consuming grilled red meat increase the colorectal cancer risk (AOR= 2.847 CI= 1.289-6.287). Taking aspirin was associated with a reduced colorectal cancer risk with (AOR 0.248 CI= 0.099-0.621).

**Conclusion:** This is one of the very few studies in Palestine that address the case of Colorectal cancer. Most studies were conducted on datasets that were collected from patient’s medical records. Our study used the classical matched case-control, which made it distinctive in its results. Our results confirmed the associations between red meat intake and smoking with colorectal cancer, but also, it showed that parental consanguinity, which is very common in the Arab societies, to be a risk factors for having this cancer. Also, aspirin intake and the consumption of fruits were shown as “protective” factors from colorectal cancer. Further longitudinal studies are needed on those at risk to develop colorectal cancer in order to be able to prevent such a fetal disease.



## محددات الإصابة بسرطان القولون والمستقيم لدى المرضى المسجلين في مستشفى بيت جالا الحكومي: دراسة الحالات والضوابط

إعداد: عيسى خالد غروز

إشراف: د. نهى الشريف

### الملخص

**خلفية الدراسة:** إن سرطان القولون والمستقيم يعد ثاني أكثر السرطانات انتشارا في فلسطين بعد سرطان الرئتين حيث يحتل ما نسبته 9.9% من جميع السرطانات. وهذه النسبة تعتبر عالية مقارنة بالدول المحيطة.

**هدف الدراسة الرئيسي:** تهدف هذه الدراسة لمعرفة محددات مرض سرطان القولون والمستقيم في مرضى السرطان الذين يتلقون العلاج في مستشفى بيت جالا الحكومي. كما تهدف هذه الدراسة لمعرفة العلاقة بين نمط الحياة، العوامل الاجتماعية والسكانية وتاريخ العائلة المرضي والحالة الصحية وزواج الأقارب وخطر الإصابة بمرض سرطان القولون والمستقيم.

**منهجية الدراسة:** نمط هذه الدراسة هي دراسة للحالات والضوابط حيث تم مطابقة الحالات والضوابط بالعمر والجنس. تكونت هذه الدراسة من 210 مشترك (105 ضابط و105 حالة). الحالات جميعها كانت مرضى مصابين ومشخصين مسبقا بمرض سرطان القولون والمستقيم وكانوا إما مرضى مقيمين في قسم الأورام أو مرضى يتلقون العلاج في العناية النهارية. الضوابط كانوا أي مرضى آخرين غير مرضى السرطانات سواء كانوا مرضى مقيمين في قسم من أقسام المستشفى غير الأورام أو كانوا مرضى العيادات الخارجية. تم عمل فحص الدم المخفي في البراز لجميع الضوابط وكانت نتائجهم جميعا سلبية. ثم قام المشاركون في الدراسة بالإجابة على اسئلة الاستبيان المعد للدراسة عن طريق مقابلتهم جميعا

**التحليل الإحصائي:** تم إدخال جميع البيانات وتحليلها باستخدام برنامج SPSS-IBM في المرحلة الأولى، تم حساب التكرارات لجميع المتغيرات، وقد عرضت البيانات في جداول وأشكال بيانية، أما في المرحلة الثانية تم فحص العلاقة بين سرطان القولون والمستقيم و عوامل الخطر عند مستوى الدلالة الإحصائية ( $p < 0.05$ )، كما تم حساب فحص العامل المستقل (t-test) لرصد الاختلاف بين العوامل الخطية بين حالات الدراسة والمجموعة الضابطة، كذلك تم حساب نموذج الانحدار اللوجستي المتعدد لجميع المتغيرات عند الدلالة الإحصائية ( $p < 0.05$ ) في تحليل وحيد المتغير للحصول على نسبة الترجيح ودرجة الثقة 95%.

**الاعتبارات الأخلاقية:** قدمت هذه الدراسة للجنة البحث العلمي والدراسات العليا في جامعة القدس. تم اخذ الموافقة للبدء في الدراسة والعمل في المستشفى من وزارة الصحة الفلسطينية. قام جميع المشاركون في الدراسة بالموافقة على المشاركة عن طريق التوقيع على نموذج موافقة.

**النتائج:** تحليل معلومات الدراسة أظهر أن معدل أعمار الحالات المشاركة في الدراسة هو 61 عاما. حيث احتل الذكور ما نسبته 54% منهم وكان 88.6% منهم متزوجا و 86.3% منهم كان يعمل و 77.1% منهم يعيش في الجزء الجنوبي للضفة الغربية و 63% كان يعيش في المدن و 92.4% كانوا مرضى سرطان قولون.

بالجهة المقابلة كان معدل أعمار ونسبة الذكور والإناث في الضوابط مطابق للحالات بسبب المطابقة المتبعة في الدراسة. لكن 90.5% منهم كانوا متزوجين و 82.4% منهم كانوا يعملون و 97.1% يعيش في المنطقة الجنوبية من الضفة الغربية حيث كان 31.4% منهم يعيش في المدن و 62.9% منهم يعيش في قرى و 31.4% منهم يعيش في المدن.

وقد أظهرت نتائج تحليل نموذج الانحدار اللوجستي المتعدد أن سكان القرى أقل عرضة لخطر الإصابة بالمرض. وأظهرت أن السكن في المنطقة الجنوبية من الضفة الغربية يزيد خطر الإصابة بالمرض ب 12 ضعف عن يسكنون بمناطق أخرى. أيضا زواج الأقارب يزيد من خطر الإصابة بالمرض والتدخين يزيد من خطر الإصابة بالمرض بنسبة 550% مقارنة بالذين لا يدخنون. بالنسبة للعوامل الغذائية، أظهرت الدراسة أن الفواكه تقلل من خطر الإصابة بالمرض ولكن اللحم الأحمر المشوي يزيد من خطر الإصابة بالمرض. تناول الأسبيرين أيضا يقلل من خطر الإصابة بالمرض.

**الخلاصة:** هذه واحدة من الدراسات القليلة في فلسطين التي تطرقت لموضوع مرض سرطان القولون والمستقيم. هذه الدراسة هي دراسة للحالات والضوابط وهذا ما يجعلها مميزة بنتائجها.

الدراسة أكدت أن التدخين، أكل اللحم الأحمر، السكن في الجنوب، زواج الأقارب كلها تزيد من خطر الإصابة بالمرض. وأظهرت أيضا ان تناول الأسبيرين والسكن في القرى وتناول الفاكهة كلها تقلل من خطر الإصابة بالمرض.

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## **List of abbreviations**

<b>BJGH</b>	<b>Biet Jala Governmental Hospital</b>
<b>CI</b>	<b>Confidence Interval</b>
<b>MOH</b>	<b>Ministry of Health</b>
<b>AOR</b>	<b>Adjusted Odds Ratio</b>
<b>CRC</b>	<b>Colorectal Cancer</b>
<b>FOBT</b>	<b>Fecal Occult Blood Test</b>
<b>SPSS</b>	<b>Statistic Package for Social Sciences</b>
<b>ENT</b>	<b>Ear, Nose, Throat</b>
<b>BMI</b>	<b>Body Mass Index</b>
<b>NSAIDs</b>	<b>Non-Steroidal Anti-inflammatory Drugs</b>
<b>MET</b>	<b>Metabolic Equivalent of Task</b>

## Chapter One: Introduction

---

### 1.1 Background

Colorectal cancer (CRC), is any development of cancer from the colon or rectum (NCI, 2018). It is also known as bowel cancer. CRC may be diagnosed by taking a biopsy from the colon during a colonoscopy or sigmoidoscopy(NCI, 2018). Colorectal cancer treatment may include surgery, radiation therapy, chemotherapy and targeted therapy(NCI, 2018). However, Screening for the disease is still an important procedure for early detection and improvement of the prognosis. The main screening method used for CRC is the fecal occult blood test (FOBT).

Colorectal Cancer is one of the major causes of morbidity and mortality worldwide. It is the third most common cancer in the world after lung and breast cancers, and the fourth in mortality (Wolf et al., 2018). It accounts for 9.7% of all cancer incidence in the world. It is estimated that 1.4 million new cases of colorectal cancer were diagnosed and 693,900 deaths worldwide in 2012. Colorectal Cancer is the third most common cancer in men after lung and prostate cancers, and the second in women after breast cancer(WHO, 2012).

Colorectal cancer is more common in the developed countries (Bener et al, 2011), where it accounts for over 63% of all colorectal cancer cases in the world, and its incidence rate is up to 10 times more in developed countries compared to the other countries(Hagggar & Boushey, 2009). The highest incidence rates are found in Australia, New Zealand, Canada, the United States, and parts of Europe, where as the lowest rates are found in Africa, South-Central Asia and South America(Hagggar & Boushey, 2009).

The incidence of colorectal cancer in the Arab world is low, despite its rank is second to breast cancer in some countries (Bener et al, 2009). In Palestine colorectal cancer ranks second to breast cancer as it composes 9.9% of all cancer cases (PHIC, 2016). This percentage is considered high in comparison to the Arab world and surrounding countries. For example, in Egypt it composes 4.4% and Jordan 9 % colorectal cancer cases of all cancers (Freedman et al, 2006).