



## FREQUENCY DETERMINATION OF COLORECTAL TUMORS AMONG PATIENTS WHO UNDERWENT COLONOSCOPY IN IRANIAN PATIENTS: A SYSTEMATIC REVIEW AND META-ANALYSIS

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Conflicts of Interest: Nil

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### ABSTRACT

**Introduction:** One of the most common cancers worldwide is colorectal cancer, which is the most common cancer of the digestive tract. Because colorectal cancer has a long asymptomatic period, it is often treatable if diagnosed during this period. Screening can reduce mortality and morbidity.

**Methods:** The methods used in this systematic review were based on the Checklist (PRISMA) Guidelines. The searches were conducted by two independent researchers and the aim was to find the relevant studies published from 1/1/2000 to 30/5/2019. Finally, a meta-analysis was performed using STATA14 statistical software.

**Results:** A total of 2526 patients who underwent Colonoscopy and a total of 4 studies from 3 provinces that met the inclusion criteria were evaluated. According to the random effect model, the total frequency of colorectal tumors in 2526 patients with Who Underwent Colonoscopy was 5% (4%-6% at a 95% confidence interval,  $I^2 = 83.2\%$ ).

**Conclusion:** As in Iran, the methods of screening for colorectal cancer on a routine basis do not exist, and given the economic, cultural and social conditions of Iran, Many of the hidden cases of colorectal malignancies remain unknown until the final stages; of course, invasive medical procedures such as Colonoscopy, in addition to other screening techniques, are very useful for the diagnosis of colorectal polyps and tumors that may be malignant.

**Key words:** Colorectal, Polyp, Tumor, Colonoscopy

### INTRODUCTION

Nowadays, cancer is one of the major health and medical problems all over the world, and the importance of this disease is increasing in Iran, as it is the third leading cause of death and the second largest group of chronic non-communicable diseases (1). New Western-style eating habits, environmental pollution, increasing tobacco consumption, and aging of the population are among the major causes that lead to an increase in cancer in Iranian society (2). One of the most common cancers worldwide is colorectal cancer, which is the most common cancer of the digestive tract (3). The incidence of colorectal cancer is increasing in both eastern and western societies, and its early detection is the best measure to reduce colorectal cancer mortality (4). One well-known pathway for the development of colorectal cancer is the adenoma-carcinoma sequence, and it is estimated that two-thirds of colorectal carcinomas originate from adenomatous polyps (5). Because colorectal cancer has a long asymptomatic period, it is often treatable if diagnosed during this period (6). Screening can reduce mortality and morbidity (7). Colonoscopy seems to be the most reliable screening method for colorectal cancer at present. This method can also be an acceptable choice for individuals. Because in addition to the

need for one type of test, people prefer to choose a method that is repeated at most one or two times during their lifetime (8).

### Methods:

#### Inclusion criteria (eligibility criteria):

The methods used in this systematic review were based on the Checklist (PRISMA) Guidelines. In this research, cross-sectional, case-control, and cohort studies were included and case studies, letters to editors, case reports, clinical trials, study protocols, systematic reviews were excluded.

**Participants:** All studies of the Frequency Determination of Colorectal Tumors among Patients Who Underwent Colonoscopy.

**Findings:** The main purpose of this study was to determine the Frequency Determination of Colorectal Tumors among Patients Who Underwent Colonoscopy and the findings were reported.

**Sampling Methods and Sample Size:** All observational studies were included in the systematic review regardless of their design. The minimum sample size was 25 patients or more.

### Search Strategy

The searches were conducted by two independent researchers and the aim was to find the relevant

studies published from 1/1/2000 to 30/5/2019. The researchers searched for published studies in the English language in MEDLINE via PubMed, EMBASE via Ovid, the Cochrane Library and Trip database. For studies published in other languages, National Database (Magiran and SID, KoreaMed and LILACS), and for unpublished studies, OpenGrey (www.opengrey.eu/), World Health Organization Clinical Trials Registry (who.int/ictpr), and ongoing studies were searched. To ensure that the studies are adequate, the reference lists of the retrieved studies were also searched and studied. Systematic review articles were searched using MeSH and open terms in accordance with publication standards. After the MEDLINE strategy was finalized, the results were compared to search for other databases, as well as PROSPERO was searched for recent or ongoing systematic reviews. The keywords used in the search strategy are: Colorectal , Polyp , Tumor , Colonoscopy

### Study Selection and Data Extraction

The two researchers independently analyzed the titles and abstracts of the articles according to eligibility criteria. After excluding additional studies, the full text of each study was evaluated on the basis of eligibility criteria and the information about the authors was collected as needed. The general information (the first author, province in which the study was conducted and year of publication), study information (the sampling technique, diagnostic criteria, data collection method, research conditions, the sample size, and risk of bias) and output scale (Frequency Determination of Colorectal Tumors) were collected.

### Quality Assessment

The extended scale of Hoy et al. was used to evaluate the quality of method and the risk of bias in each observational study. This 10-item scale assesses the quality of studies according to their external validity (items 1 to 4 evaluate the target population, sampling frame, and minimum selection bias) and internal validity (items 5 to 9 evaluate the data collection, problem statement, research scale and data collection tool, while item 10 evaluates the data analysis bias). The risk of bias was measured by two researchers independently and disagreements were resolved by consensus.

### Data Collection :

All eligible studies were included in the data collection after a systematic review and the data were integrated using the cumulative chart. The

random effect model was evaluated based on the overall prevalence of the disease among the participants. The heterogeneity of the initial studies was assessed using the  $I^2$  test. In addition, subgroups were analyzed to determine the heterogeneity by participants' male to female, year of publication, and Province. Finally, a meta-analysis was performed using STATA14 statistical software.

### Study Selection:

A total of 421 articles were extracted through preliminary searches in various databases. Of the 421 essential studies identified by the analysis of titles and abstracts, 387 ones were eliminated because of irrelevant titles. Of the 19 existing studies, 15 ones were excluded. Of the remaining studies, 4 met the study inclusion criteria. (Fig. 1)

### Research Properties:

A total of 2526 patients who underwent Colonoscopy and a total of 4 studies from 3 provinces that met the inclusion criteria were evaluated. Simple sampling was used to select the sample ( $n = 21$ ). Of the studies were retrospective. studies, were from Tehran, Arak and Ardabil . In most studies the risk of bias was low. Data were originally collected from medical records. The hospital was the main study site. (Table 1)

### The meta-analysis of the Frequency Determination of Colorectal Tumors Among Patients Who Underwent Colonoscopy:

According to the random effect model, the total frequency of colorectal tumors in 2526 patients with Who Underwent Colonoscopy was 5% (4%-6% at a 95% confidence interval,  $I^2 = 83.2\%$ ). (Fig. 2)

### Subgroup Analysis

#### Meta Regression Results

### The results of meta-regression between participants' male to female and the Frequency Determination of Colorectal Tumors Among Patients Who Underwent Colonoscopy:

The regression of the study was evaluated by the relationship between the Frequency Determination of Colorectal Tumors and participants' male to female and the total rate of Colorectal Tumors. There was no significant linear trend in the univariate meta-regression to explain the effect size of participants' male to female. (Fig. 3)

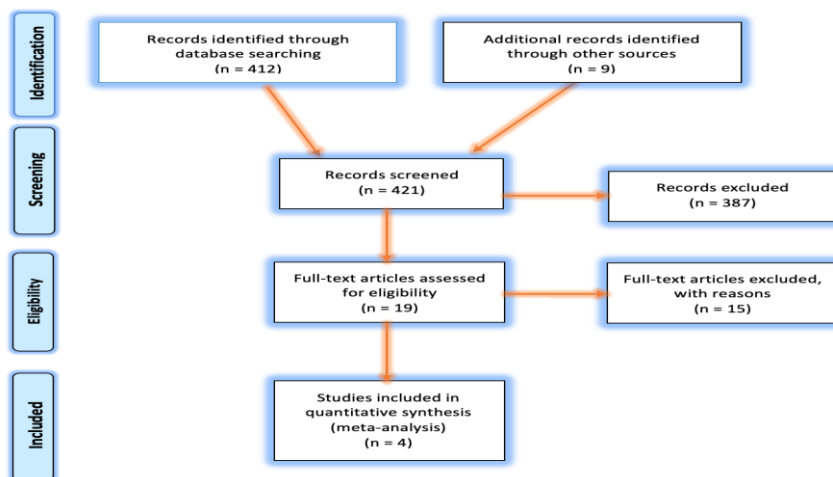


Figure 1: PRISMA flow diagram

Table 1: characteristics of the included studies

| Author      | Province | Publications year | Number of patients | Male to female | Prevalence | Mean of age |
|-------------|----------|-------------------|--------------------|----------------|------------|-------------|
| Houshyar 15 | Ardabil  | 2011              | 853                | 419/432        | 5.6%       | -----       |
| Faani 16    | Arak     | 2008              | 580                | 322/258        | 4.3%       | -----       |
| Chehre 17   | Tehran   | 2008              | 100                | 37/63          | 21%        | 16/1 ± 44/3 |
| Agah 18     | Tehran   | 2009              | 993                | 529/464        | 4.3%       | -----       |

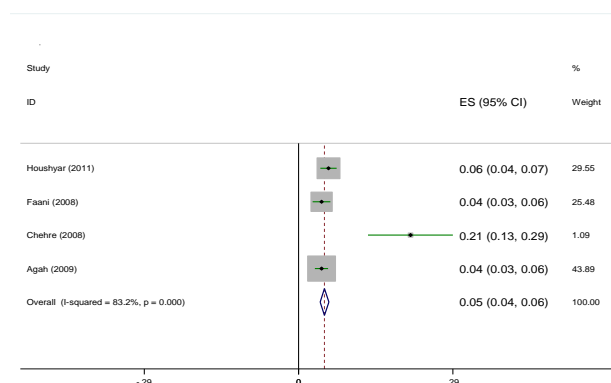


Figure 2: Frequency Determination of Colorectal Tumors and its 95% interval for the studied cases according to the year the study was conducted based on the model of the random effects model.

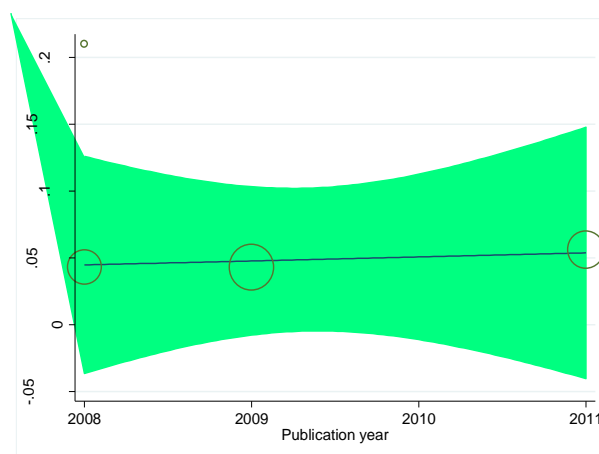


Figure 4: Meta-regression between publication year of study and Frequency Determination of Colorectal Tumors

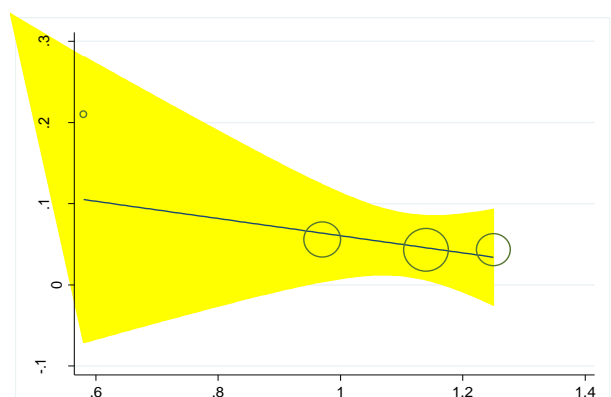


Figure 3: Meta-regression between male to female ratio of study and Frequency Determination of Colorectal Tumors

**Discussion:**

According to the random effect model, the total frequency of colorectal tumors in 2526 patients with Who Underwent Colonoscopy was 5% (4%-6% at a 95% confidence interval,  $I^2 = 83.2\%$ ). The cause of this type of cancer is not yet known precisely, but it has been determined that it is a genetic disease that can be hereditary or sporadic (9). Regarding the gender factor, it is the third most prevalent in women after lung and breast cancers and in men after lung and prostate cancers (10). It is also the third leading cause of cancer deaths in women after lung and breast cancers and in men after lung and prostate cancers (11). The age over

50 years, family history of colorectal cancer, nutrition, obesity, smoking and physical inactivity are major risk factors for this disease (12). The incidence of colorectal cancer increases markedly with increasing age, but at 6 to 8 percent, the disease occurs in persons less than 40 years of age (13). The annual incidence rate of the tumor is 134,000 new cases a year, with 55,000 deaths reported each year due to colorectal cancer, accounting for 10% of cancer deaths in the United States (14). Despite increasing public awareness of the importance of cancer, especially the prevention of the disease, the problem remains a top priority, and the comprehensive control program for this disease has not yet been adopted at national level (15). To achieve this goal, it is important to know the information on the prevalence of various cancers in the country and to screen cancer patients as a first step. As in Iran, the methods of screening for colorectal cancer on a routine basis do not exist, and given the economic, cultural and social conditions of Iran, Many of the hidden cases of colorectal malignancies remain unknown until the final stages; of course, invasive medical procedures such as Colonoscopy, in addition to other screening techniques, are very useful for the diagnosis of colorectal polyps and tumors that may be malignant.

## References

- Robertson DJ, Lieberman DA, Winawer SJ, Ahnen DJ, Baron JA, Schatzkin A, Cross AJ, Zauber AG, Church TR, Lance P, Greenberg ER. Colorectal cancers soon after colonoscopy: a pooled multicohort analysis. *Gut*. 2014 Jun 1;63(6):949-56.
- Yamane LS, Scapulatempo-Neto C, Alvarenga L, Oliveira CZ, Berardinelli GN, Almodova E, Cunha TR, Fava G, Colaiacovo W, Melani A, Fregnani JH. KRAS and BRAF mutations and MSI status in precursor lesions of colorectal cancer detected by colonoscopy. *Oncology reports*. 2014 Oct 1;32(4):1419-26.
- Cooper GS, Xu F, Barnholtz Sloan JS, Schluchter MD, Koroukian SM. Prevalence and predictors of interval colorectal cancers in medicare beneficiaries. *Cancer*. 2012 Jun 15;118(12):3044-52.
- Engel C, Rahner N, Schulmann K, Holinski-Feder E, Goecke TO, Schackert HK, Kloor M, Steinke V, Vogelsang H, Möslein G, Görgens H. Efficacy of annual colonoscopic surveillance in individuals with hereditary nonpolyposis colorectal cancer. *Clinical Gastroenterology and Hepatology*. 2010 Feb 1;8(2):174-82.
- Conaghan PJ, Maxwell-Armstrong CA, Garrioch MV, Hong L, Acheson AG. Leaving a mark: the frequency and accuracy of tattooing prior to laparoscopic colorectal surgery. *Colorectal Disease*. 2011 Oct;13(10):1184-7.
- Lutgens MW, Oldenburg B, Siersema PD, Van Bodegraven AA, Dijkstra G, Hommes DW, De Jong DJ, Stokkers PC, Van Der Woude CJ, Vleggaar FP. Colonoscopic surveillance improves survival after colorectal cancer diagnosis in inflammatory bowel disease. *British journal of cancer*. 2009 Nov;101(10):1671.
- Hamzeh Zarei. (2018). Prevalence of surgical wound infection in Iranian patients: A systematic review and meta-analysis. *Int. J. Curr. Res. Chem. Pharm. Sci.* 5(12): 1-6
- Boursi B, Halak A, Umansky M, Galzan L, Guznar-Gur H, Arber N. Colonoscopic screening of an average-risk population for colorectal neoplasia. *Endoscopy*. 2009 Jun;41(06):516-21.
- Le Roy F, Manfredi S, Hamonic S, Piette C, Bouguen G, Riou F, Bretagne JF. Frequency of and risk factors for the surgical resection of nonmalignant colorectal polyps: a population-based study. *Endoscopy*. 2016 Mar;48(03):263-70.
- Brenner H, Chang-Claude J, Jansen L, Seiler CM, Hoffmeister M. Role of colonoscopy and polyp characteristics in colorectal cancer after colonoscopic polyp detection: a population-based case-control study. *Annals of internal medicine*. 2012 Aug 21;157(4):225-32.
- Haji A, Ryan S, Bjarnason I, Donaldson N, Papagrigroriadis S. Colonoscopic high frequency mini-probe ultrasound is more accurate than conventional computed tomography in the local staging of colonic cancer. *Colorectal Disease*. 2012 Aug;14(8):953-9.
- Mulder SA, van Soest EM, Dieleman JP, van Rossum LG, Rob JT, van Leerdam ME, Kuipers EJ. Exposure to colorectal examinations before a colorectal cancer diagnosis: a case-control study. *European journal of gastroenterology & hepatology*. 2010 Apr 1;22(4):437-43.
- Gado A, Ebeid B, Abdelmohsen A, Axon A. Colorectal cancer in Egypt is commoner in young people: Is this cause for alarm?. *Alexandria Journal of Medicine*. 2014;50(3):197-201.
- Carethers JM. Screening for colorectal cancer in African Americans: determinants and rationale for an earlier age to commence screening. *Digestive diseases and sciences*. 2015 Mar 1;60(3):711-21.
- Yazdanbad, Sadeghi Fard, Iranparvar, Javaheri,. Evaluation of colorectal cancers in patients referred to Ardabil educational center (from April 1998 until the end of July 2002)
- Fani Ali. Evaluation of Frequency Distribution and Causes of rectorrhagia in Adult Patients Referred to Arak University of Medical Sciences Clinic from September 2000 to September 2001.
- Qamarchehreh M, Nouri N, Mohaghegh shalmani B, Zali. Frequency of Histopathologic Findings of Flat and Depressed Colorectal Lesions in Patients

Referred to Gastrointestinal ward of Taleghani Hospital in 2006. Journal of Islamic Azad University of Medical Sciences. 2008 Jul 15;18(2):113-9.

18. Agah SH, Ghasemi AB, Rezaei MA, Ashayeri N, Fereshtehnejad SM, Mohammad Sadeghi H.

Frequency determination of polyps and colorectal tumors among patients who underwent colonoscopy in Shariati hospital. Razi Journal of Medical Sciences. 2009 Jan 15;15:13-8.