

Gastrointestinal Cancer Prevention Policies: A Qualitative Systematic Review and Meta-Synthesis

Abstract

This qualitative systematic review was conducted to summarize the policies for prevention of common gastrointestinal cancers worldwide. This study was conducted using PubMed, Web of Science, SCOPUS, and ProQuest databases. Two independent reviewers assessed included studies for methodological quality and extracted data by using standardized tools from Joanna Briggs Institute (JBI). Primary study findings were read and reread to identify the strategies or policies used in the studies for prevention of gastrointestinal cancers. The extracted findings were categorized on the basis of their similarity in meaning. These categories were then subjected to a meta-synthesis. The final synthesized findings were graded according to the ConQual approach for establishing confidence in the output of qualitative research synthesis. From the nine included studies in this review, 39 findings were extracted and based on their relevance in meaning were aggregated into 12 categories. Four synthesized findings were developed from these categories. We used World Health Organization report on 2000 for synthesizing the findings. The four synthesized findings were “service provision”, “resource generation”, “financing”, and “stewardship”. In order to reach a comprehensive evidence informed policy package for the prevention of gastrointestinal cancers, there should be a great communication among the interventions conducted directly on patients, health system infrastructures, and resources.

Keywords: *Gastrointestinal cancer, policy, primary prevention, secondary prevention, strategy*

Introduction

Non-Communicable Diseases (NCDs) are of the biggest threats to health and human development worldwide, particularly in developing countries. Seven in 10 people die from one of the four major types of NCDs including cardiovascular disease, cancers, diabetes, and chronic pulmonary diseases.^[1] Results of a study showed that the global incidence and mortality of all cancer types among young adults aging 20-39 in 2012 was 43.3 and 15.9 per 100000 people per year, respectively.^[2]

Based on the results of a study, liver and stomach cancers are predicted to be two of the first five causes of death.^[3] Further, findings from a review study showed that the burden of gastrointestinal cancers, especially the five most common cancers of this system, including stomach, colon, liver, pancreas, and esophagus has an increasing trend in Asia.^[4] In a recent study conducted by Darabi and colleagues in 2016 it was reported that the incidence

rate of gastrointestinal cancers has steadily increased over the past 10 years.^[5]

It has been reported that cancer incidence can be controlled and reduced by prevention, screening, and finally with a timely and effective cure.^[6] According to the results of a systematic analysis of global burden of disease published in a study, it is expected that the incidence of cancer increase in the future; hence, it will be better to allocate some limited sources to prevention and early diagnosis of cancers.^[7]

National and international policies and strategies that provide NCDs with high quality preventive and curative care on the whole and specifically to each of four major types of NCDs can be helpful for health policy makers and health care providers.^[8,9] In this regard, World Health Organization (WHO) and United Nations general assembly have developed global action plans for the prevention of NCDs.^[10,11]

For example, in Iran there are some policies other than national action plan for prevention of NCDs,^[12] such as nutritional traffic light labeling and taxation on

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unhealthy food products for the prevention of NCDs in Iran.^[13] Also, African countries have developed policies for controlling risk factors of NCDs.^[14] For example, in Zambia the government has made the policy response and developed a strategic plan for controlling NCDs.^[15]

Despite many international and national policies and strategic plans for the prevention of NCDs and gastrointestinal cancers, there has not yet been a comprehensive qualitative systematic review in this context. As it is mentioned in a study, there is a strong need for producing evidence informed policies for the prevention of NCDs.^[16] Hence, we conducted the current systematic review to summarize policies for the prevention of common gastrointestinal cancers worldwide. Based on the context of their country, health policy makers could rely on the results of this review in a way to implement the synthesized findings.

Methods

Inclusion criteria

Types of participants

This qualitative review considered studies that included patients of any age, gender, and cultural background that have been prevented from a common gastrointestinal cancer. Also, the studies that included physicians and all health services providers, managers, and policy makers from a variety of cultural background, which provided or decided interventions for the prevention of gastrointestinal cancers, were included.

Phenomena of interest

The current systematic review considered the studies that described policies and strategies for the prevention of common gastrointestinal cancers. Any type of policies reported in the studies; such as strategies, action plans, and rules, were considered and included.

Context

Qualitative studies conducted in health care and community settings all over the world were included.

Types of studies

Current review considered qualitative studies with all methodologies that include but are not limited to designs such as phenomenology, ethnography, case studies, grounded theory, and qualitative components of mixed method studies.

Search strategy

The search strategy aimed to consider both published and unpublished studies. A preliminary limited search of MEDLINE was undertaken to find MeSH terms and text words in order to develop a search strategy. All the identified keywords and MeSH terms were searched across

all the included databases. Furthermore, the reference list of all the included studies was screened for any additional research.

This review was limited to the studies published in English due to inability to translate the studies having been published in other languages. As the first integrated program of WHO to prevent and control non-communicable diseases was published in 1988, the search strategy was limited to the studies published between January 1988 to 30 June 2018.

Information sources

The databases searched were PubMed, ISI Web of Knowledge, SCOPUS, The Cochrane Library, JBI database of systematic reviews and implementation reports, and ProQuest dissertations, and theses. Also, the following databases were searched for any qualitative report: WHO, United Nations, and World Bank. A full search strategy is provided in Appendix 1.

Study selection

Following the search, all the identified citations were collated and uploaded into Endnote software and then the duplicates were removed. The titles and abstracts were then screened by two independent reviewers for assessment against the inclusion criteria for the review. The studies that met the inclusion criteria were retrieved in full and assessed in detail against the inclusion criteria. The included studies underwent a process of critical appraisal. Any disagreements between the reviewers were resolved through discussion, and if it didn't help, a third reviewer independently appraised the paper.

Assessment of methodological quality

Each eligible study was assessed for methodological quality by two independent reviewers using Critical Appraisal Checklist for Qualitative Research from JBI.^[17] Any disagreements between the reviewers were resolved through discussion, and if it didn't help, they were referred to the third reviewer. The reviewers considered the papers with a score of 7 and above as a high-quality paper.

Data extraction

Data were extracted from the included papers using the standardized data extraction tool from JBI.^[17] Based on this tool, the extracted data included phenomena of interest, research methodology, context of the study (clinical, cultural, and geographical), participants, and study methods.

Data synthesis

The primary study findings were read and reread to identify the strategies or policies used in the studies for prevention of gastrointestinal cancers. These findings were grouped on the basis of their similarity in meaning. Categories were developed by the chief reviewer and were verified and

accepted by all the reviewers. These categories were then subjected to a meta-synthesis in order to produce a single comprehensive set of synthesized findings that could be used as a basis for evidence-based practice.

Assessing certainty in the findings

The final synthesized findings were graded according to the ConQual approach^[18] for establishing confidence in the output of qualitative research synthesis. In ConQual approach, each paper is initially ranked as “high” if it is a qualitative paper. From this starting point, each paper is then graded for “dependability”, and then “credibility”. The dependability score is based on the scores of five questions (2, 3, 4, 6, and 7) from the critical appraisal checklist.^[17] The ranking per paper moves up or down (or stays the same) depending on the “dependability” score as follows:

- 4-5 “yes” responses: the paper remains unchanged (high)
- 2-3 yes’ responses: downgrade from high to moderate
- 0-1 yes’ responses: downgrade from high to low, or moderate to very low.

The synthesized findings may then be downgraded based on the aggregate level of dependability from across the included findings. For example, if the majority of individual findings have a “low” level of dependability, this designation should then apply to the resultant synthesized findings.

The credibility score is assigned to each synthesized findings by crosschecking how many findings of what type included in the categories associate with the synthesized findings:

- Unequivocal (U): relates to evidence beyond reasonable doubt which may include findings that are matter of fact, directly reported/observed and not open to challenge
- Credible (C): those that are, albeit interpretations, plausible in light of data and theoretical framework. They can be logically inferred from the data because the findings are interpretive they can be challenged
- Un-Supported (US): when neither 1 nor 2 applies and when most notable findings are not supported by the data.

Then, each synthesized finding was ranked according to the following scoring rubric:

- All unequivocal findings: remains unchanged
- Mix of unequivocal/credible findings: downgraded one (-1)
- Credible/unsupported findings: downgraded three (-3)
- Not-supported findings: downgrade four (-4).

The final ConQual score was then determined due to the levels of dependability and credibility.

Results

Study inclusion

In total, 9660 studies from PubMed, SCOPUS, Web of Science, JBI database of systematic reviews and implementation reports, The Cochrane Library, and ProQuest; 1592 database sources from WHO, United

Nations, and World Bank; and 132 records from hand search of selected journals were identified using the search strategy. After removing duplicates using bibliographic software (EndNote), 9355 records remained. Title and abstract screening reduced this record to 63. Finally, nine articles were included in the review based on inclusion/exclusion criteria and methodological quality assessment. After full-text review, the most common reasons for exclusion were: (1) the research question didn’t meet the aim of systematic review; (2) the research didn’t have a qualitative methodology. Figure 1 is a PRISMA flow diagram of the study selection and inclusion process.

Characteristics of the included studies

The included studies provided qualitative data on the interventions and policies undertaken to prevent gastrointestinal cancers all over the world. The studies included in this review were published during the period 2004-2017. One of the nine included studies was a mixed method research with the descriptive methodology in the qualitative part.^[19] One other study was part of a larger governmental study which was pragmatic and not underpinned by an exact methodology.^[20] The other seven studies didn’t state the specific qualitative methodology used in the research.^[21-27] One of the included studies explored interventions of controlling liver cancer^[21]; while, the others assessed colorectal cancer.^[19,20,22-27] Five out of nine studies assessed attitudes of health care providers,^[19-21,26,27] three studies surveyed patient’s viewpoints,^[22,23,25] and one study considered both consumers and health care providers.^[24] A total of 150 health care providers and 121 patients and health services consumers participated in the eight included studies.^[19-26] The number of participants in one study was unclear.^[27] One of the nine studies was conducted internationally in 11 countries of Australia, China, France, Germany, Italy, Japan, Spain, South Korea, Taiwan, Turkey, and the United States,^[21] two of the included studies were conducted in USA,^[25,26] two in Canada,^[19,24] two in Australia,^[20,22] one in England,^[23] and one was unclear.^[27] The full characteristics of the included studies are indicated in Appendix 2.

Methodological quality

Among nine selected studies, three scored 9 out of 10,^[20,25,26] four scored 8 out of 10,^[21-24] and the remaining scored 7.^[19,27] Table 1 summarizes the methodological quality of all the nine studies. Criteria 1, 2, 4, 5, 8, and 10, which are related to the congruity between research methodology and philosophical perspective, research objectives, representation and the analysis of data, interpretation of results, as well as representation of participant’s voices and the congruity between conclusion and analysis of data, were met by all the included studies. Any of the included studies addressed the statement locating the researcher culturally or theoretically, criteria 6.

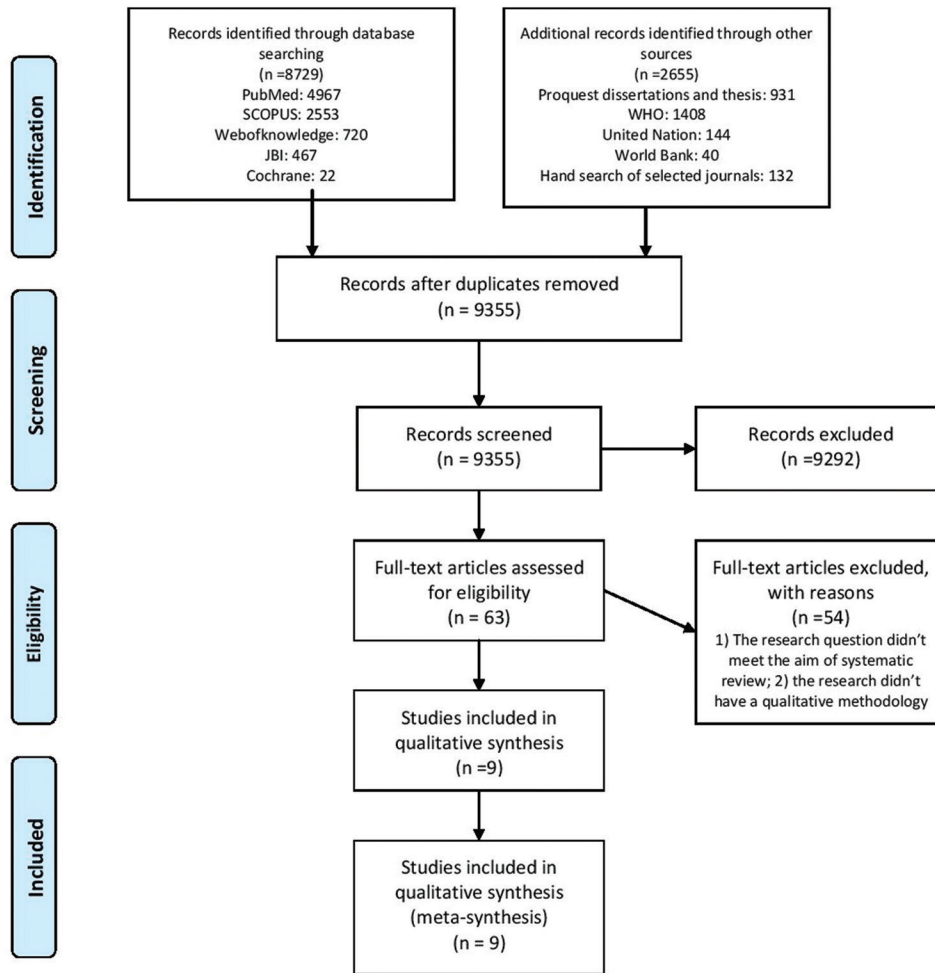


Figure 1: Search results and study selection and inclusion process

Review findings

From the nine included studies in this review, 39 findings were extracted and based on their relevance were aggregated into 12 categories. Four synthesized findings were developed from these categories. Level of credibility was allocated to each extracted finding to indicate the level of support as below: Unequivocal [U], Credible [C] and Unsupported [US]. Thirty-seven out of 39 findings were considered to be “Unequivocal” evidence; while the remaining two were assigned as “Unsupported”. The extracted findings for the included studies and their supported illustrations are indicated in Appendix 3. All the illustrations are referenced to the page of the article, from which they were extracted.

The framework we used for synthesizing the findings was the WHO report on 2000,^[28] in which the functions of health systems were categorized into four categories. These four synthesized findings were: “service provision”, “resource generation”, “financing”, and “stewardship”. Appendix 4 shows full overview of the findings linked to the categories and synthesized findings; while a brief description of each synthesized finding is reported below:

Synthesized finding 1: Service provision

This synthesized finding was developed from the aggregation of six categories and 27 findings. This synthesized finding implies the policies and interventions which deal with the service provision of the population. The interventions of primary and secondary preventions are included in this synthesized finding.

The first category “managing risk factors of the population” is developed from five findings: “Prevention of viral hepatitis (B and C) mostly through vaccination”, “early risk assessment for Hepatocellular Carcinoma (HCC)”, “Modification of risk factors such as alcohol use, obesity and diabetes for HCC”, “Physical activity for intermediate or high risk colorectal adenoma”, and “Consumption of red meat for intermediate or high risk colorectal adenoma”. The findings of this category are the interventions and policies considering primary phase of prevention.

The second category “clinical methods of population screening” is developed from five findings: “Fecal occult blood testing (FOBT)”, “colonoscopy”, and “sigmoidoscopy”. Both FOBT and sigmoidoscopy were

Table 1: Assessment of methodological quality of included studies

Criteria/Studies	Bridges	Jilcott Pitts	Buchman	Clavarino	Dowson	Dowswell	Goel	Liles	Sarfaty
Congruity between the stated philosophical perspective and the research methodology	Y	Y	Y	Y	Y	Y	Y	Y	Y
Congruity between the research methodology and the research objectives	Y	Y	Y	Y	Y	Y	Y	Y	Y
Congruity between the research methodology and the methods used to collect the data	Y	Y	N	Y	Y	Y	Y	Y	Y
Congruity between the research methodology and the representation and analysis of data	Y	Y	Y	Y	Y	Y	Y	Y	Y
Congruity between the research methodology and the interpretation of results	Y	Y	Y	Y	Y	Y	Y	Y	Y
Statement locating the researcher culturally or theoretically	N	N	N	N	N	N	N	N	N
The influence of the researcher on the research, and vice-versa, is addressed	U	Y	U	U	Y	U	U	Y	U
Participants, and their voices, are represented adequately	Y	Y	Y	Y	Y	Y	Y	Y	Y
Research is ethical	Y	Y	Y	Y	Y	Y	Y	Y	U
Conclusions appear to flow from the analysis or interpretation of the data	Y	Y	Y	Y	Y	Y	Y	Y	Y
Total	8	9	7	8	9	8	8	9	7

Y: Yes, N: No, U: Unclear

repeated in two different studies, with no illustration addressed for sigmoidoscopy.

The third category “enhancing knowledge of population” is derived from five findings: “Increasing public awareness about importance of HCC through education by health campaigns and media exposure”, “Public education about screening”, “Use of support staff (medical assistants) trained in educating and motivating patients on screening and follow-up”, “Self-care and community resources for colorectal cancer (CRC)”, and “Providing follow-up information for screening results as needed”. The findings of this category focus on enabling the population about the importance of prevention in gastrointestinal cancers and also follow-up services.

The fourth category “Population management” is developed from three findings: “Identify and manage populations for CRC”, “Screening of population at a certain age”, and “Importance of targeting the asymptomatic population”. This category focuses on the identification and screening of certain population.

The fifth category “Care management” is derived from three findings: “Plan and manage care for CRC”, “Track and coordinate care: referral tracking for CRC”, and “Measure and improve performance: implement continuous quality improvement for CRC”. As it is seen, all of the findings in this category consider colorectal cancer. These findings focus on the aspects of provided care.

The sixth category “Increasing access to care” is derived from six findings of “Free colorectal cancer screening tests”, “Building walk-in clinics”, “Distribution

of the FOBT kit by mail for colorectal screening”, “Socioeconomic differences among patients”, “Need to make CRC screening a self-referral program, similar to other screening programs (e.g., breast cancer screening)”, and “Referral process for a screening colonoscopy involves multiple steps and departments, which sometimes creates miscommunication and lack of follow-up”. The main focus of this category is on providing prevention services in a way that improve access of population, especially people living on the edge with low socioeconomic features. Also, removing obstacles, which may prevent people from getting services including bureaucracy and long distance, are the issues of interest for this category.

Synthesized finding 2: Resource generation

This synthesized finding was aggregated from four categories and nine findings and summarizes the interventions for creating and improving resources.

The first category “Guideline development” consists of two findings: “Developing mandatory screening guidelines and systems for HCC”, and “Too many options in the system for screening and no clear guidelines for providers or patients”.

The second category “Enhancing provider ability” is developed from two findings of “Education and communication about resource stewardship and evidence based outcomes as it pertains to CRC screening seen as helpful”, and “Enhance access and communication between team”. In this category, improving some skills is focused for care providers.

The third category “Enhancing knowledge among providers” is composed of three findings: “Educating primary care physicians about importance of liver disease and related risk factors”, “Increasing political (government) awareness”, and “Improving awareness among policy makers about importance of HCC”.

The fourth category “Use of technology” is developed from two findings of “Access and utilization to electronic medical record tools that help identify screening gap or indicate prior completed screening”, and “Use of automated telephone outreach for CRC screening”. This category focuses on the use of technology as a tool to motivate people in order to use screening services for gastrointestinal cancers.

Synthesized finding 3: Financing

This synthesized finding is composed of one category and two findings. In this synthesized finding, the interventions of financing preventive services is provided.

The category “Financial support” is derived from two findings of “Improving surveillance of incidence, prevalence, and burden of liver cancer through financial support”, and “Better allocation of funds for screening programs”.

Synthesized finding 4: Stewardship

This synthesized finding is composed of one category and three findings. In this synthesized finding, the stewardship

and the main missions of health services providers is discussed.

The category “Organizational factors” conclude three findings of “Overall focus on quality and prevention as a primary part of organization’s mission and values”, “Trust in the structure of the integrated health system to enable alignment of evidence-based CRC screening approaches with available resources and department roles”, and “Presence of primary care physician (PCP) champions to assist other providers in navigating and integrating latest research with organizational goals and patient demand”.

ConQual summery of findings

Table 2 shows the summary of findings that includes the major elements of the review and details how the ConQual score was developed for each synthesized finding.

Discussion

Findings from this systematic review summarized the policies and strategies applied by the studies to prevent common gastrointestinal cancers worldwide. Four meta-synthesized findings resulted from this study as below: “service provision”, “resource generation”, “financing”, and “stewardship”.

Synthesized findings 1 are composed of policies directly related to service provision of the population and controlling the major risk factors. Physical activity and consumption

Table 2: ConQual summery of findings

Systematic review title: Policies for prevention of common gastrointestinal cancers
 Population: Patients of any age, gender and cultural background that has been prevented from a common gastrointestinal cancer, physicians and all health services providers, managers and policy makers.
 Phenomena of interest: Policies and strategies for prevention of common gastrointestinal cancers
 Context: Studies conducted in any country

Synthesized finding	Type of research	Dependability	Credibility	ConQual score	Comments
Service provision	Qualitative	Moderate *	Downgraded 2 levels due to mix of unequivocal (U), credible (C) and unsupported (US) findings: 21 U+4 C+2 US	Very low	Downgraded three levels due to dependability and credibility of primary studies
Resource generation	Qualitative	Moderate *	Downgraded 1 level due to mix of unequivocal (U) and credible (C): 9 U+2 C	Low	Downgraded two levels due to dependability and credibility of primary studies
Financing	Qualitative	Moderate *	Downgraded 1 level due to mix of unequivocal (U) and credible (C): 6 U+3 C	Low	Downgraded two levels due to dependability and credibility of primary studies
Stewardship	Qualitative	High *	Downgraded 1 level due to mix of unequivocal (U) and credible (C): 2 C+1U	Moderate	Downgraded one level due to credibility of primary studies

*For synthesized finding 1, of the nine studies, three addressed four of the dependability questions, five addressed three, and one addressed two. So of the nine studies, six had moderate level and three had high level of dependability and the total level of dependability for synthesized finding 1 is moderate. For synthesized finding 2, of the three studies, one addressed four of the dependability questions, and two addressed three. Due to the equal number of high level and moderate level studies in this synthesized finding, we referred to the number of findings. Nine of the findings in synthesized finding 2 caught high level and two caught moderate level of dependability. For synthesized finding 3, the one study included have addressed three dependability questions. So the total level of dependability for synthesized finding 3 is moderate. For synthesized finding 4, the one study included have addressed four dependability questions. Therefore, the total level of dependability for synthesized finding 4 is high.

of red meat were found in the studies included in this review. Similarly, DeTroye and colleagues reported in their review study that physical activity improved overall health of patients survived from colorectal cancer as well as prevented recurrence of this cancer.^[29] Anderson and co-authors in their randomized controlled trial provided an intervention of physical activity within colorectal cancer screening program and reached significant decrease in their participant's weight that offered considerable potential for risk reduction of disease in older adults.^[30] Pimpin and colleagues mentioned in their study that lifestyle changes such as reducing alcohol intake and weight reduction can lead to a decrease in the burden of liver diseases.^[31] The findings from the current study showed that vaccination is a good strategy for the prevention of viral hepatitis B and C. Similarly, Wang and colleagues,^[32] Chang,^[33] Meireles and co-authors,^[34] and Chang and co-authors^[35] reported in their research that liver cancer and hepatitis B virus can be effectively prevented through vaccination. Public education about risk factors and importance of screening and early detection of gastrointestinal cancers are findings of current study. Different studies in the world illustrated that public awareness of gastrointestinal cancer's symptoms, risk factors, and screening modalities are low.^[36-42] There are some educational policies and strategies should be designed to public about relative subjects by policy makers. Finally, in the last category of the first synthesized finding, improving geographical and financial aspects of access to care, decreasing socioeconomic differences of service consumers and reducing bureaucracy and additional stages of getting services were proposed. Signorelli and colleagues showed socioeconomic disparities in access to screening program of hepatocellular carcinoma in public services setting, which provided services to the large population in Brazil.^[43]

Synthesized finding 2 was aggregated form four categories of guideline development, enhancing provider ability, enhancing knowledge among providers, and use of technology. These are main resources of health system that are essential in care provision. In Japan, cancer screening guidelines have become a valuable tool for developing evidence-based policies for national cancer screening programs. Accordingly, clinical practice guidelines for gastric and colorectal cancers have been published over the last 15 years in this country.^[44] Federici and co-authors indicated in their study that involvement of general physicians in colorectal cancer screening programs is crucial due to their direct contact with the healthy population. They also found that general physicians' knowledge and compliance with clinical practice guidelines are important factors to enhance screening rate.^[45] The Results of qualitative research showed that primary health care providers plays an important role in guiding individuals for decisions of cancer screenings; so, it is important to improve these providers' knowledge and communication skills.^[46] Koo and colleagues in their study found that the

role of general physicians in motivating ethnically diverse population is very important in colorectal cancer screening programs due to the unawareness of population. Therefore, increasing general physicians' awareness is essential.^[47] The results of a literature review showed that there should be a multidisciplinary team approach between providers of primary care including primary care physicians, nurses, physician assistants, nurse practitioners, clerical staff, health educators, and behavioral scientists.^[48] Use of technology in the second category of the second synthesized finding implies the use of electronic medical record and automated telephone outreach as patient-centered, user friendly and acceptable ways of follow- up for patients and health care providers.^[26] Telephone outreach intervention for colorectal screening is indicated to improve the screening rate significantly.^[49] Also, the results of a Cochrane systematic review showed that automated telephone communications improved patients' health behaviors in screening programs.^[50] The results of a literature review showed that adoption of electronic medical records can improve cancer screening rates by empowering patients in decision making on preventive programs.^[48]

Synthesized finding 3 and 4 in this review relates to financing and stewardship. Quality of care is a major factor in improving prevention and screening rates. Gastroenterologists should upgrade their services quality improvement, and audit and re-audit their services.^[51] The results of a study illustrated that implementation of a quality improvement program in a colonoscopy center increased the rate of cancer detection in population.^[52] Integrating the latest evidence with organizational goals and patient demand was one of the components of synthesized finding 4 in the current study. Green and colleagues in their research showed that collaboration between primary care providers and research team led to a successful project that improved colorectal cancer screening rates from 75.1% at the baseline prior to program start up to 78.0% after 12 months of intervention.^[53,54]

Conclusion

This systematic review synthesized the findings of nine qualitative studies, which captured the policies for the prevention of common gastrointestinal cancers. In order to reach a comprehensive evidence informed policy package for the prevention of gastrointestinal cancers, there should be a great communication among interventions conducted directly on patients, interventions related to health system and its infrastructure, and interventions related to resources of health system including human resources and financial resources.

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Conflicts of interest

There are no conflicts of interest.

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Appendix 1. Search strategy

Search name	Search query
#1	(cancer[Title/Abstract]) OR cancers[Title/Abstract] OR neoplasm[Title/Abstract] OR neoplasms[Title/Abstract] OR tumor[Title/Abstract] OR tumors[Title/Abstract] OR neoplasia[Title/Abstract] OR neoplasias[Title/Abstract] OR malignancy[Title/Abstract] OR malignancies[Title/Abstract]
#2	(gastrointestinal[Title/Abstract] OR digestive[Title/Abstract] OR gastric[Title/Abstract] OR stomach[Title/Abstract] OR stomachs[Title/Abstract] OR esophagus[Title/Abstract] OR esophageal[Title/Abstract] OR pancreas[Title/Abstract] OR colon[Title/Abstract] OR colorectal[Title/Abstract] OR liver[Title/Abstract] OR livers[Title/Abstract])
#3	(prevent*[Title/Abstract] OR “secondary prevention”[Title/Abstract] OR “secondary preventions”[Title/Abstract] OR “early therapy”[Title/Abstract] OR “early therapies”[Title/Abstract] OR “primordial prevention”[Title/Abstract] OR “primordial preventions”[Title/Abstract] OR “preventive therapy”[Title/Abstract] OR “preventive therapies”[Title/Abstract] OR “preventive measures”[Title/Abstract] OR “primary prevention”[Title/Abstract] OR “primary preventions”[Title/Abstract] OR screening[Title/Abstract] OR “early detection”[Title/Abstract] OR “early diagnosis”[Title/Abstract])
#4	(policy[Title/Abstract] OR policies[Title/Abstract] OR polic*[Title/Abstract] OR plan[Title/Abstract] OR program[Title/Abstract] OR plans[Title/Abstract] OR programs[Title/Abstract])
#5	“1988/01/01”[PDAT] : “2018/06/31”[PDAT]
#6	#1 AND #2 AND #3 AND #4 AND #5

ISI Web of Knowledge, search date 2018/7/10

Search name	Search query
#1	TI=(cancer OR cancers OR neoplasm OR neoplasms OR tumor OR tumors OR neoplasia OR neoplasias OR malignancy OR malignancies)
#2	TI=(gastrointestinal OR digestive OR gastric OR stomach OR stomachs OR esophagus OR esophageal OR pancreas OR colon OR colorectal OR liver OR livers)
#3	TI=(prevent* OR “secondary prevention” OR “secondary preventions” OR “early therapy” OR “early therapies” OR “primordial prevention” OR “primordial preventions” OR “preventive therapy” OR “preventive therapies” OR “preventive measures” OR “primary prevention” OR “primary preventions” OR screening OR “early detection” OR “early diagnosis” OR screening OR “early detection” OR “primary preventions”)
#4	TI=(policy OR policies OR polic* OR plan OR program OR plans OR programs)
#5	<i>LANGUAGE: (English)
#6	#1 AND #2 AND #3 AND #4 AND #5

SCOPUS, search date 2018/7/11

Search name	Search query
#1	TITLE-ABS-KEY(cancer OR cancers OR neoplasm OR neoplasms OR tumor OR tumors OR neoplasia OR neoplasias OR malignancy OR malignancies)
#2	TITLE-ABS-KEY(gastrointestinal OR digestive OR gastric OR stomach OR stomachs OR esophagus OR esophageal OR pancreas OR colon OR colorectal OR liver OR livers)
#3	TITLE-ABS-KEY(prevent* OR “secondary prevention” OR “secondary preventions” OR “early therapy” OR “early therapies” OR “primordial prevention” OR “primordial preventions” OR “preventive therapy” OR “preventive therapies” OR “preventive measures” OR “primary prevention” “early diagnosis” OR screening OR “early detection” OR “primary preventions”)
#4	TITLE-ABS-KEY(policy OR policies OR polic* OR plan OR program OR plans OR programs)
#5	PUBYEAR > 1988
#6	#1 AND #2 AND #3 AND #4 AND #5

ProQuest Dissertations and Thesis, search date 2018/7/15

Search name	Search query
#1	(ti(cancer) OR ti(cancers) OR ti(neoplasm) OR ti(neoplasms) OR ti(tumor) OR ti(tumors) OR ti(neoplasia) OR ti(neoplasias) OR ti(malignancy) OR ti(malignancies)) AND (ti(gastrointestinal) OR ti(digestive) OR ti(gastric) OR ti(stomach) OR ti(liver) OR ti(esophagus) OR ti(esophageal) OR ti(pancreas) OR ti(colon) OR ti(colorectal))
#2	(ti(prevent*) OR ti(“secondary prevention”) OR ti(“early detection”) OR ti(“early therapy”) OR ti(screening) OR ti(“primordial prevention”) OR ti(“early diagnosis”) OR ti(“preventive therapy”) OR ti(“preventive therapies”) OR ti(“primary prevention”))
#3	(ti(policy) OR ti(policies) OR ti(polic*) OR ti(plan) OR ti(plans) OR ti(program) OR ti(programs))
#6	#1 AND #2 AND #3

Appendix 2: Characteristics of included studies

Study	Methodology	Phenomena of interest	Setting (geographically/ clinically)	Participants	Data analysis	Data collection	Authors conclusion	Reviewer's comment
Bridges, Gallego, Blauvelt (2011)	Qualitative methodology, not stated	Exploring clinicians' perceptions of current public policy needs for controlling liver cancer internationally	Geographically: Asia, Europe, and North America (11 countries)	Liver cancer clinicians being involved in policy and related disease prevention, detection, and management. (n=20)	Constant comparative method	In-depth semi structured interviews	There were identified different needs including improving prevention, awareness and financial support for liver cancer control. These needs were similar in studied countries, although health policy in all countries differs from each other.	Conclusions drawn from the results relate to the aims of the study.
Jilcott Pitts, Lea, May, Stowe, Hamill, Walker, Fitzgerald (2013)	Qualitative methodology, not stated	Examination of barriers and facilitators to colorectal cancer screening	Geographically: Eastern North Carolina, Bertie County. Economically: The percentage of persons living below the poverty level was 24%. Clinically: Bertie County carries a heavy burden of colorectal cancer mortality and incidence. Socially: Educational attainment levels are lower in Bertie County with 9.6% of Bertie County residents over the age of 25 having a bachelor's degree or higher.	Bertie County residents (n=45)	Framework analysis	Focus group discussions (n=4)	The identified barriers and facilitators help policy makers to design new strategies for colorectal cancer screening to reduce disparities.	Conclusions drawn from the results relate to the aims of the study.

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Buchman, Rozmovits, Glazier (2016)	Mixed method study, Qualitative descriptive study	Assessing equity and practice issues in colorectal cancer screening	Geographically: Toronto Clinically: A setting with large disparities in other forms of cancer screening and relatively good access to colonoscopy through hospital- based services and private endoscopy clinics.	Physicians from 12 family health teams ($n=29$, eight males and 21 females)	Thematic analysis using constant comparative method	Semi-structured telephone interviews	Providing an informed choice of screening method to patients might result in higher screening rates and fewer disparities.	Clear outline both the methods and methodology.
Clavarino, Janda, Hughes, Mar, Tong, Stanton, Aitken, Leggett, Newman (2004)	Qualitative methodology, not stated	Exploring community and medical perspectives on screening for colorectal cancer using FOBT	Geographically: a rural Queensland community with a population of approximately 4200 residents aged 50 years or older. Clinically: The area is situated approximately 100 km from a large regional centre with the necessary facilities to provide colonoscopy follow-up	People known to have completed an FOBT. ($n=18$) Non participated people were interviewed. ($n=12$)	Iterative inductive analysis	Focus group discussion, Semi structured interview (telephone interview)	Information about the objectives of screening programs, in general, and the efficacy of FOBT screening in particular, needs to be provided to the community to ensure informed individual choice.	Conclusions drawn from the results relate to the aims of the study.
Dowson, Crane, Lyons, Burnham, Bowman, Perez, Travaglia (2017)	Qualitative methodology, pragmatic	General practitioners' perceptions of population based bowel screening and their influence on practice	Geographically: metropolitan and regional New South Wales (NSW), Australia	General Physicians ($n=31$)	Thematic analysis	Semi-structured interviews	The findings suggest a greater emphasis on the preventative opportunity of FOBT screening would be beneficial, as would formally engaging GPs in the promotion of bowel screening.	There was congruity between methods and the research question.

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Dowswell, Ryan, Taylor, Daley, Freemantle, Brookes, Jones, Haslop, Grimmett, Cheng, Sue (2012)	Qualitative methodology, not stated	Assessing patients' preferences for appropriate and acceptable dietary and physical activity interventions.	Geographically: England Clinically: patients were selected from the Royal Wolverhampton Hospitals NHS Trust patient tracking database and had been diagnosed with a I/HRA at colonoscopy after a positive faecal occult blood test (FOBT).	Patients (n=28)	Thematic analysis	Focus groups (n=4), telephone interviews (n=4)	Without a full understanding of the role of high risk polyps in the etiology of colorectal cancer, the motivation to change entrenched behaviors (such as inadequate physical activity and a diet that includes high levels of red and processed meats) may be lacking.	There was congruity between methods and the research question.
Goel, Gray, Chart, Fitch, Saibil, Zdanowicz (2004)	Qualitative methodology, not stated	Assessing attitudes and acceptability of consumers and doctors towards colorectal screening with faecal occult blood testing (FOBT) and colonoscopy.	Geographically: Toronto and Kitchener	Patients (n=18, nine males and nine females) and physicians (n=15, eight from Toronto and seven from Kitchener)	Thematic analysis	Focus groups (n=8)	Implementation of colorectal screening programs requires substantial educational efforts for both consumers and doctors.	Conclusions drawn from the results relate to the aims of the study.
Liles, Schneider, Feldstein, Mosen, Perrin, Rosales, Smith (2015)	Qualitative methodology, not stated	Exploring implementation challenges and successes of a population-based colorectal cancer screening program	Geographically: Washington and the Portland, Oregon Clinically: a not for-profit group health maintenance organization (HMO) with about 485,000 members in Southern Washington and the Portland, Oregon, metro area	Health plan leaders (n=8), program managers (n=4), endoscopy specialists (n= 23, 15 gastroenterologists, 8 general surgeons), and primary care providers (n=20).	Content analysis	Interview, focus group	The majority of stakeholders at various levels consistently reported that an automated telephone-reminder system to contact patients and coordinate mailing fecal tests alleviated organizational constraints on staff's time and resources.	There was congruity between methods and the research question.

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Sarfaty, Stello, Johnson, Sifri, Borsky, Myers (2013)	Qualitative methodology, not stated	Colorectal Cancer screening in the Framework of the medical home Model	Geographically: unclear Clinically: Primary care practices	Office managers, clinicians, clinical team members, and office staff	Thematic analysis	Interview, focus group	Many practices lacked a systematic way to identify patients who were not up to date on screening while they were visiting the practice, thereby passing up the best opportunity to reach them.	Results reported in this study summarized survey findings of an earlier publication.
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Appendix 3. Study findings and illustrations

Bridges JF, Gallego G, Blauvelt BM. Controlling liver cancer internationally: A qualitative study of clinicians' perceptions of current public policy needs. *Health research policy and systems*. 2011;28;9(32):1-8.

Findings	Illustration from publication	Evidence
Prevention of viral hepatitis (B and C) mostly through vaccination	<i>"Needless to say, prevention will reduce the number of cases. Prevention of infection of hepatitis B and C comes first". (p3)</i>	Unequivocal
Early risk assessment for Hepatocellular Carcinoma (HCC)	<i>"We can actually identify the high risk patients and use the well- developed screening strategies to monitor these patients, so that these patients, if they ever develop hepatocellular carcinoma, can actually be diagnosed at the early stage, and treated..."(p4)</i>	Unequivocal
Modification of risk factors such as alcohol use, obesity and diabetes for HCC	<i>"I would say the first thing is really to improve the awareness with regard to potential risk factors. These include the obvious, hepatitis infection with B and C, lifestyle modification to reduce alcohol, and make sure that we know the epidemiology trend for nonalcoholic fatty liver disease and the potential impact on HCC incidence." (p5)</i>	Unequivocal
Improving awareness among policy makers about importance of HCC	<i>"The principal gap for HCC is the absence of a common policy in all regions [of the country]." (p5)</i>	Credible
Increasing public awareness about importance of HCC through education by health campaigns and media exposure	<i>"There's absolute ignorance among [the] common population and there is a clear need for education" 'Public awareness must be increased to let people know that chronic liver disease is a major risk factor for HCC". (p5)</i>	Unequivocal
Educating primary care physicians about importance of liver disease and related risk factors	<i>"Primary care doctors need to be sensitized to the risk of liver disease, the implications, the detection in particular of viral hepatitis, the treatment options, or the need to refer, and ultimately screening for liver cancer". (p5)</i>	Unequivocal
Increasing political (government) awareness	<i>"Definitely you need to have some policy changes at the government level...." (p6)</i>	Credible
Developing mandatory screening guidelines and systems for HCC	<i>"...On a national basis the government has no strict plan for HCC and this is a big issue". (p4)</i>	Credible
Better allocation of funds for screening programs	<i>"Funding is a major consideration"(p6)</i>	Unequivocal
Improving surveillance of incidence, prevalence and burden of liver cancer through financial support	<i>"We have already started a nationwide liver cancer registry, for more than five years now. It is voluntary data. More than 20 institutes are taking part. But because of a limited budget, actually, it is not so active." (p6)</i>	Unequivocal

Jilcott Pitts SB, Lea CS, May CL, Stowe C, Hamill DJ, Walker KT, et al. "Fault-line of an earthquake": A qualitative examination of barriers and facilitators to colorectal cancer screening in rural, Eastern North Carolina. *The Journal of rural health: Official journal of the American Rural Health Association and the National Rural Health Care Association*. 2013 Winter;29(1):78-87.

Findings	Illustration from publication	Evidence
Free colorectal cancer screening tests	<i>"Well because I wouldn't have to worry about the cost of it, you know the bill, it would be free, so I could take it [screening] a lot better."</i> (p82)	Unequivocal
Building walk-in clinics	<i>"Most doctor's offices around or health departments would come up with more . . . health fairs . . . hemocult screenings . . . maybe they would see a lot of people start coming out."</i> (p84)	Unequivocal
Providing follow-up information for screening results as needed	<i>"The screenings would . . . be able to provide information as to where . . . they can go to find out where they can get the services to, to help for them to be able to go see a doctor . . . if something were to come up from the hemocults screening itself, if there's . . . an organization that . . . they could go to . . . different organizations that you know could help them, or I know some churches do that."</i> (p84)	Unequivocal
Public education about screening	<i>"But they need to be educated about it first, then you get more people going to the doctor's office and get screened for it."</i> (p82)	Unequivocal

Buchman S, Rozmovits L, Glazier RH. Equity and practice issues in colorectal cancer screening: Mixed-methods study. Canadian family physician. 2016;62(4):186-93.

Findings	Illustration from publication	Evidence
Fecal occult blood testing (FOBT)	<i>"[Fecal occult blood testing] is cheaper and better than nothing and that's what I tell patients"</i> (p190)	Unequivocal
Colonoscopy	<i>"The risk of the perforation and the bleeding—and I've had 2 already, patients who've had bleeds from colonoscopies—has made it such that I tell them the benefit of the FOBTs ... versus the benefit of the colonoscopy ... and then they decide which way they want to go."</i> (p190)	Credible
Socioeconomic differences among patients	<i>"Most of my patients who are living on the edge socioeconomically are not walking into the office with the agenda of thinking about preventive care screening ... it's just not up there on their list of priorities in the way it is for someone who's more comfortable socioeconomically and has the social and mental space to think about this on an ongoing basis."</i> (p191)	Unequivocal

Clavarino AM, Janda M, Hughes KL, Del Mar C, Tong S, Stanton WR, et al. The view from two sides: a qualitative study of community and medical perspectives on screening for colorectal cancer using FOBT. Preventive medicine. 2004;39(3):482-90.

Findings	Illustration from publication	Evidence
Distribution of the FOBT kit by mail for colorectal screening	<i>"I never used the Rotary one, because I couldn't be bothered. This one came in the mail and was so private"</i> (p485)	Unequivocal

Dawson G, Crane M, Lyons C, Burnham A, Bowman T, Perez D, et al. General practitioners' perceptions of population based bowel screening and their influence on practice: a qualitative study. BMC Family Practice. 2017;18(36):1-7.

Findings	Illustration from publication	Evidence
Screening of population at certain age	<i>"I think the studies so far have shown that if we do screen the population at certain ages, that it does seem to pick up some of the bowel cancers earlier and therefore it's a good thing to do."</i> (p4)	Unequivocal
Importance of targeting the asymptomatic population	<i>"What I see is to pick up cancer in the asymptomatic population, and the higher the pick-up rate, the better the outcome because it's fixable in the early stages, it's treatable. So my role is to pick up [cancer] early, as soon as possible."</i> (p4)	Unequivocal
Flexible sigmoidoscopy	-	Unsupported

Dowswell G, Ryan A, Taylor A, Daley A, Freemantle N, Brookes M, et al. Designing an intervention to help people with colorectal adenomas reduce their intake of red and processed meat and increase their levels of physical activity: A qualitative study. BMC Cancer. 2012;12(255):1-13.

Findings	Illustration from publication	Evidence
Physical activity for intermediate or high risk colorectal adenoma	“But my problem is I can walk now because I’ve just retired but for the last ten years I’ve been working nights. So when I’m awake my wife’s asleep and the other way round, we only ever used to meet at weekends. So we’d perhaps slot one walk in but for ten years we hardly did anything at all. And I put on weight and ate some horrible food and now my life is changing so we’re back to walking again now.”(p6)	Credible
Consumption of red meat for intermediate or high risk colorectal adenoma	“Oh yeah, I’ve cut it tremendously down, even in the week. The only time we really eat red meat is if we have a Sunday lunch”(p6)	Credible

Goel V, Gray R, Chart P, Fitch M, Saibil F, Zdanowicz Y. Perspectives on colorectal cancer screening: A focus group study. *Health Expectations*. 2004;7(1):51-60.

Findings	Illustration from publication	Evidence
FOBT for colon cancer screening	“At least [its] not painful...it’s in privacy of your own home”(p56)	Unequivocal
Sigmoidoscopy	-	Unsupported

Liles EG, Schneider JL, Feldstein AC, Mosen DM, Perrin N, Rosales AG, *et al.* Implementation challenges and successes of a population-based colorectal cancer screening program: a qualitative study of stakeholder perspectives. *Implementation science*. 2015;10(41):1-16.

Findings	Illustration from publication	Evidence
Too many options in the system for screening and no clear guidelines for providers or patients	“It’s amazing the paucity of evidence around what’s really the best test. The stool cards have been tested more rigorously than other interventions, so we know more about that. But that doesn’t necessarily mean we know that colonoscopy is not as good.”(p6)	Unequivocal
Referral process for a screening colonoscopy involves multiple steps and departments, which sometimes creates miscommunication and lack of follow-up	“The referral is more challenging than for something like a Pap, which I can do it when they come in. I have more control over that. As opposed to CRC screening [colonoscopy] and having to send in a referral, having the patient be called back or a letter sent. It’s just more steps to get in.” (p6)	Unequivocal
Overall focus on quality and prevention as a primary part of organization’s mission and values	“The one thing we don’t argue is that we need screening of some type for colon cancer. Everyone knows the old adage is that any screen is better than no screening. So we all agree that we need to get there to screen the population. And we’ve got to decide what’s the best way to do it for our population.” (p7)	Credible
Trust in the structure of the integrated health system to enable alignment of evidence-based CRC screening approaches with available resources and department roles	“And I know that, you know, we had a very strong analyst. We had a very strong negotiator. We had a strong physician lead who was very interested and extremely engaged. And then we had a project manager, I mean, that could just kind of manage all the pieces and make sure that everybody shows up and things are done in a timeline.” (p7)	Credible
Use of support staff (medical assistants) trained in educating and motivating patients on screening and follow-up	“We have our own MAs and own staff and we can say, okay, when a patient checks in and they’re due for one of these, you hand them this. If there’s no need, not involving the physician just speeds up things. If you have a nice handout and your staff is knowledgeable about the task and can explain it to somebody, like an MA, there’s no reason for taking time out of an appointment for the physician to go over the test, when the patient is there for something else. So finding the earliest person who is able to deliver the message early on is better.” (p7)	Unequivocal
Presence of PCP champions to assist other providers in navigating and integrating latest research with organizational goals and patient demand	“Presentations and talks [with clinician champion] have really been helpful. They have helped me kind of frame my conversations about everything... having a clinician who has looked at the research is really powerful.” (p7)	Unequivocal
Access and utilization to EMR tools that help identify screening gap or indicate prior completed screening. Recent emphasis on increasing access to colonoscopy	“Systematically we are pretty good at reaching out to people and [we] have pretty good tools to identify them. We know who they are. We know what they need. And, we have a pretty good process to tell them what they need and to try to connect the dots for them.” (p7)	Unequivocal

Use of automated telephone outreach for CRC screening	“For colon cancer screening, what we pretty much have always done is in-reach during a visit... having an automated program makes it easier for us—especially for reaching those people whom we never see [in a visit] and tend to miss.”(p9)	Unequivocal
Education and communication about resource stewardship and evidence based outcomes as it pertains to CRC screening seen as helpful	“Just recently, we’ve actually fed back to physicians, what their colonoscopy rate was versus their colleague who has the same risk adjusted population. And, some doctors were just mortified that they were sending out twenty times more than the doctor down the hall who had patients that weren’t that different... so as an organization, we owe all of our patients a research stewardship perspective.” (p10)	Unequivocal
Need to make CRC screening a self-referral program, similar to other screening programs (e.g., breast cancer screening)	“Make it self-referral”. (p13)	Unequivocal

Sarfaty M, Stello B, Johnson M, Sifri R, Borsky A, Myers RM. Colorectal cancer screening in the framework of the medical home model: findings from focus groups and interviews. *American journal of medical quality: the official journal of the American College of Medical Quality*. 2013;28(5):422-8.

Findings	Illustration from publication	Evidence
Enhance access and communication between team	“Yes, [we have a policy for] anyone over 50. The process is, if we are seeing a patient, the chart is pulled and prepared the day before. We look and see what the patient needs and put on a sticky note. The provider addresses the issue and makes a referral to a surgeon. Then the front office sets up the appointment with the surgeon. The provider reminds patients to be screened. Charts are audited all the time by clinical staff. The office manager/ practitioner reviews test results when they are returned and schedules appropriate follow-up.” (p424)	Unequivocal
Identify and manage populations for CRC	“I think it would be nice if we did have a systematic way to identify those that are not getting them and should be getting them. That being said, it almost always requires a discussion with a patient’s primary care physician about what this is. So I think it would be nice to track the data, send a letter out saying to go for your colorectal cancer screening. Talk to your doctor next time . . . even if they get that letter and the doctor doesn’t mention it.”(p425)	Unequivocal
Plan and manage care for CRC	“Yes, it goes in their medical record in the EMR when they get the screening done. So we review it at each appointment. At each checkup appointment, we review the health maintenance screen, and it will have on it whether or not they are up to date with their colorectal screen.”(p425)	Credible
Self-care and community resources for CRC	“We all participate in patient education. Most of it is done by providers and clinical staff. We do have a rack of brochures on patient education and use printouts of educational materials approved by the hospital.”(p426)	Unequivocal
Track and coordinate care: referral tracking for CRC	“We do know about our referrals, like colonoscopies, which is (the type of test we usually use)—Dr (name) and I would refer them, then our staff will make sure that the referral carries through. But are we closing that hole whether it was done or not? Are we following up on that? We are not there yet.”(p427)	Unequivocal
Measure and improve performance: implement continuous quality improvement for CRC	“I think, moving forward, this is one thing we’ve discussed doing in regards to a quality improvement initiative is preventive maintenance tracking, including colorectal cancer screening and mammographies and the rest of that stuff. . . . We just haven’t gotten to that point yet.”(p428)	Unequivocal

Appendix 4: Results of meta-synthesis**Meta synthesis 1**

Findings	Categories	Synthesized finding
Prevention of viral hepatitis (B and C) mostly through vaccination	Managing risk factors of the population	
Early risk assessment for Hepatocellular Carcinoma (HCC)		
Modification of risk factors such as alcohol use, obesity and diabetes for HCC		
Physical activity for intermediate or high risk colorectal adenoma	Clinical methods of population screening	
Consumption of red meat for intermediate or high risk colorectal adenoma		
Fecal occult blood testing (FOBT)	Enhancing knowledge of population	
Colonoscopy		
Sigmoidoscopy	Service provision	
Increasing public awareness about importance of HCC through education by health campaigns and media exposure		
Public education about screening	Population management	
Use of support staff (medical assistants) trained in educating and motivating patients on screening and follow-up		
Self-care and community resources for colorectal cancer (CRC)	Care management	
Providing follow-up information for screening results as needed		
Identify and manage populations for CRC	Increasing access to care	
Screening of population at certain age		
Importance of targeting the asymptomatic population		
Plan and manage care for CRC		
Track and coordinate care: referral tracking for CRC		
Measure and improve performance: implement continuous quality improvement for CRC		
Free colorectal cancer screening tests		
Building walk-in clinics		
Distribution of the FOBT kit by mail for colorectal screening		
Socioeconomic differences among patients		
Need to make CRC screening a self-referral program, similar to other screening programs (e.g., breast cancer screening)		
Referral process for a screening colonoscopy involves multiple steps and departments, which sometimes creates miscommunication and lack of follow-up		

Meta synthesis 2

Findings	Categories	Synthesized finding
Developing mandatory screening guidelines and systems for HCC	Guideline development	
Too many options in the system for screening and no clear guidelines for providers or patients		
Education and communication about resource stewardship and evidence based outcomes as it pertains to CRC screening seen as helpful	Enhancing provider ability	
Enhance access and communication between team		
Educating primary care physicians about importance of liver disease and related risk factors	Enhancing knowledge among providers	Resource generation
Increasing political (government) awareness		
Improving awareness among policy makers about importance of HCC	Use of technology	
Access and utilization to EMR tools that help identify screening gap or indicate prior completed screening		
Use of automated telephone outreach for CRC screening		

Meta synthesis 3

Findings	Categories	Synthesized finding
Improving surveillance of incidence, prevalence and burden of liver cancer through financial support Better allocation of funds for screening programs	Financial support	Financing

Meta synthesis 4

Findings	Categories	Synthesized finding
Overall focus on quality and prevention as a primary part of organization's mission and values Trust in the structure of the integrated health system to enable alignment of evidence-based CRC screening approaches with available resources and department roles Presence of primary care champions to assist other providers in navigating and integrating latest research with organizational goals and patient demand	Organizational factors	Stewardship