

**Knowledge, Attitude and Practice Survey of Colorectal Cancer among Adult Population in
Tamil Nadu, India**

(A cross-sectional survey)

Master of Public Health Integrated Experience Project

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by

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LIST OF ABBREVIATIONS

ANOVA – Analysis of variance

CRC - Colorectal cancer/ large bowel cancer

DM - Diabetes Mellitus

EU - European Union

FOBT - Fecal Occult Blood Test

gFOBT - guaiac Fecal Occult Blood Test

HBM - Health Belief Model

IARC - International Agency for Research on Cancer

IGF-2 - Insulin like Growth Factor-2

INR - Indian Rupee

IST - Indian Standard Time

SD – Standard deviation

SES - Socio-economic Status

TN - Tamil Nadu

TBL - Tracheal, Bronchial and Lung cancer

WHO - World Health Organization

WB - World Bank

YLLs - Years of Life Lost

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EXECUTIVE SUMMARY

Background: Colorectal cancer is a major health issue worldwide (CRC). India is a lower-middle income country and the estimated age standardized incidence rate of CRC among men (7.2 per 100,000) was higher than women (5.1 per 100,000) in the year 2012. In 2012, the data suggests the CRC incidence rate in India will be doubled by 2035.

Aim: This study assessed the knowledge, attitude and practice regarding CRC and its screening among the adult population (18 years of age and above) living in the state of Tamil Nadu.

Methods: A cross sectional survey with telephone interviews was conducted. The participants were randomly contacted through random digit dialing. The Institutional Review Board (IRB) of the American University of Armenia approved the study.

Results: The mean age of the participants was 31.56 (SD = 9.8). The percent mean scores of risk factors and signs and symptoms based on the prompted question was 42.80 (SD = 19.49) and 62.65 (SD=27.48). The percent mean score on signs and symptoms in the prompted were significant with education level of the participants after adjusting for variables ($p=0.966$ for 0-8 years of education, $p=0.001$ for more than 12 years of compared to the reference of 9-12 years of education). The majority of the respondents (78.2%) strongly agreed that “CRC can be cured if detected early”. There was no association between willingness to do screening with the level of SES (high SES, OR=0.48, $p=0.097$).

Conclusion: We found that knowledge of CRC and the practice is low among the study participants. Educational campaigns are needed among all the age groups to increase the awareness about risk factors, signs and symptoms and screening of CRC.

1. INTRODUCTION

Colorectal cancer is a major health issue worldwide (CRC). It is defined as a large bowel malignant neoplasm which can involve the large intestine, especially the terminal part of the large intestine such as colon or rectum.¹

1.1 Global burden of cancer and CRC

Cancer is next to the cardiovascular diseases in causing mortality.² In 2015, around 17.5 million new cases and 8.7 million deaths occurred due to cancer worldwide.³ Prostate cancer, Tracheal Bronchial Lung (TBL) cancer, and CRC are the most common cancer types among men, with annual incidences of about 1.6 million, 1.4 million and 920,000 respectively.³ Among women, the most prevailing cancer types are breast cancer, CRC, and TBL cancer, with annual incidences of 2.4 million, 733,000 and 640,000 respectively.³ CRC ranks third for the most common cancer in incidence and ranks second for the common cause of cancer deaths among both men and women in the year of 2015.³ Between 2005 and 2015, CRC had the fourth highest absolute Years of Life Lost (YLLs) among all types of cancer.^{3,4} Globally, in 2015, the incidence of CRC was 1.7 million, and it caused 832,000 deaths.³ The estimated age standardized incidence rate of CRC among men (20.6 per 100,000) was higher than women (14.3 per 100,000).⁵ In 2012, the estimated age standardized CRC specific mortality rate among men and women were 10.0 per 100,000 and 6.9 per 100,000 respectively.⁵ Globally, the odds of developing CRC is higher among men when compared to women³; 1 in 28 among men, and 1 in 43 among women.

By the year of 2030, it is expected that the incidence of CRC (2012) will be increasing by 60%, resulting in more than 2.2 million new cancer cases and 1.1 million CRC related deaths

annually.⁶ In terms of CRC incidence and mortality rates, the trends are not the same across countries. While the incidence and mortality rates are increasing rapidly in the low and middle-income countries, they are slightly decreasing in the high-income (developed) countries.⁷ The reasons for the decreasing in rates, particularly in developed countries, is wide availability of screening and treatment options³ which are helpful not only in early detection of cancer but also in its prevention through polypectomy.⁷

The cost of treatment of CRC is high, and it vary by the stage of cancer.⁸ Treatment cost is a significant burden, particularly for patients with low socio-economic status (SES)⁹ and those who do not have an insurance to cover the treatment expenses.⁸ The total cost on the individuals as well as the caregivers include the cost of chemotherapy, radiotherapy, surgery and also transportation.¹⁰ Due to the burden of cancer, CRC patients and their caregivers might have reduced working hours affecting their income^{8,11} and eventually their quality of life.¹²

1.2 India: Country profile and burden of CRC

India is a lower-middle income country where the majority of the population does not have free medical coverage for cancer care, and the catastrophic burden of financing treatment of cancer entirely falls on the patient and their families.¹³ In 2012, the number of new cancer cases was 477,000 among men and 537,000 among women.¹⁴ In the same year, the cancer caused about 357,000 and 326,000 deaths among men and women, respectively¹⁴. In 2012, the estimated age standardized incidence rate of CRC among men (7.2 per 100,000) was higher than women (5.1 per 100,000).¹⁵ In the same year, the estimated age standardized CRC specific mortality rate was 5.4 per 100,000 for men and 3.8 per 100,000 for women.¹⁵ In Pakistan, the age standardized incidence and mortality rates of CRC among men was 4.7 and 3.5 per 100,000

respectively. Among women, the age standardized incidence rate was 3.3 per 100,000 and the mortality rate was 2.5 per 100,000.¹⁵

Based on 2015 data, CRC ranked sixth for the incidence rate and fourth for the mortality rate among all cancer types in India.³ In 2012, the data from IARC predicted that the CRC incidence rate in India will be doubled by 2035.¹³

1.3 State of Tamil Nadu and burden of CRC

Tamil Nadu (TN) is one of the 29 states of India, and it is located in the southern part of the country.¹⁶ It is bordered by Kerala, Karnataka, Pondicherry, and Andhra Pradesh. According to the 2011 census, the population in TN is approximately 72.1 million. The literacy rate among the people in TN, including both urban and rural areas, is 80.3%. There are 32 districts in TN, 12 of which are metropolitan cities. Chennai is the capital of TN, and it has a population of 4.6 million with a literacy rate of 90.3%.¹⁶

According to the Adyar cancer registry, during 2012-2014, the cumulative incidence rate of CRC was 4.4 per 100,000 and 3.0 per 100,000 among men and women, respectively.¹⁷ A cohort study conducted in 2007 suggested that burden of cancer will increase by 32% by 2016 compared with 2002-2006¹⁸, however, the 2016 data are still not available to verify the projection. These dramatic increase in rates could be attributable to changes in the prevalence of risk factors of cancer and some of the socio-demographic characteristics.¹⁹

1.4 Risk factors of developing CRC

Most of the CRC patients are usually asymptomatic in their early stages.²⁰ There are some known risk factors for developing CRC.²⁰ The possible risk factors for developing CRC are consumption of red^{19,21} and processed meat^{19,22}, diabetes mellitus (DM)^{19,23,24}, family history

of CRC (among first-degree relatives)^{19,25}, physical inactivity^{19,26,27}, cholecystectomy^{19,28}, old age¹⁹, male gender¹⁹, obesity¹⁹, and alcohol consumption.²⁹

DM is one of the important risk factor for the development of CRC²³. In patients with DM, there is an increase in level of glucose in blood which leads to hyperinsulinemia. Hyperinsulinemia in turn can lead to the growth of epithelial cells in the colon and rectum which is a potent risk for CRC²³. Insulin-like Growth Factor-2 plays a major role in stimulating carcinogenic pathway in CRC by promoting cell differentiation, cell proliferation and cell death/apoptosis²⁰.

Consumption of red meat is increasing among the population, particularly in developed countries.²¹ Meat such as mutton, lamb, pork, beef and veal are considered as red meat. The mechanisms that red meat increases risk of developing CRC are uncertain. However, a meta-analysis study have suggested some possible mechanisms.²¹

Links between physical inactivity and risk of CRC remain controversial. Several studies have shown that physical inactivity is inversely associated with risk of developing cancer among both men and women.^{30,31} Several studies also have found that physical activity reduces the risk of CRC.^{26,27}

1.5 Diagnostic methods and treatment

Many studies have shown that the main reasons for CRC mortality are financial barriers, lack of awareness in the population, lack of knowledge among the health care physicians and nurses, and poor diagnostic methods.^{32,33} Early detection of CRC and educational campaigns play a major role in preventing deaths from CRC.³³

According to the American College of Gastroenterology and the American Cancer Society's recommendations, all men and women aged 50 years and above are recommended to

have regular screening for CRC. However, Center for Disease Control and Prevention suggests the CRC screening for those above 75 to be based on individuals characteristics and preferences.³⁴

Screening helps to detect abnormalities in the mucosa of the colon and rectum (e.g. precancerous and adenomatous polyps).³² Screening has been shown to be more effective in decreasing both incidence and mortality rates of CRC.³⁵ Health care providers play a significant role in the screening uptake by the population.^{32,36} Low screening uptake among the population could be partly attributable to the lack of health care providers effort in disseminating information on CRC and the screening procedures.^{32,36}

There are a few methods for CRC screening and detection. The commonly utilized methods are fecal occult blood test (FOBT), flexible sigmoidoscopy and colonoscopy³⁷, and gFOBT³⁸. FOBT is the method of choice for CRC screening recommended by the European Union (EU). FOBT can be performed without any medical personnel, and it is easy to use.³⁹ However, if the person has a negative FOBT test, then the test should be repeated after a year, and if the test result is positive, then the person is referred for a colonoscopy or a sigmoidoscopy. gFOBT method is not widely used because of its low sensitivity.³⁸ Sigmoidoscopy is useful to detect the polyps or adenomas up to the distal part of the colon. Colonoscopy is the gold standard, which can evaluate the entire mucosa of the colon and during the intervention polyps can be removed easily. Both sigmoidoscopy and colonoscopy have disadvantages; they are painful and inconvenient for patients.³⁸

According to the American Cancer Society, the treatment of the CRC mainly depends on the stages.⁴⁰ CRC can have five stages (stage 0 to stage 4). Partial colectomy (partial removal of the affected part of the colon), total colectomy (total removal of the colon), chemotherapy, and

radiotherapy possible methods of treatment indicated depends on the stage of CRC. However, the cases detected in later stages have a poor prognosis.⁴⁰

1.6 Similar studies conducted in other countries

A study conducted in Riyadh, Saudi Arabia, assessed the knowledge of CRC among the general population who visited malls in that region. The survey asked questions on risk factors, symptoms, barriers and attitude towards screening and the data were analyzed in the context of the Health Belief Model (HBM). The study found that 13.9% of the participants did not have knowledge about the risk factors of CRC.³⁵

In a study conducted in the Brunei Darussalam, the CRC related knowledge was assessed and categorized into poor, moderate and satisfactory. More than a quarter of participants (26.5%) had a knowledge score on risk factors, signs and symptoms of CRC falling in the moderate or satisfactory categories. The study also found an association between CRC knowledge scores and respondents' education.⁴¹ Similarly, a few studies in India found an association between education and knowledge about cancer.^{42,43}

1.7 Rationale for the study

Several studies have assessed the knowledge, attitude and practices towards CRC and its screening and found that they are associated with the screening uptake by the population. Similar studies are lacking in TN, in particular, and India, in general. Assessing the knowledge, attitude and practices on CRC and its screening could help the stakeholders in developing interventions to target CRC in this population. Such study could also provide basis and directions for future research on CRC.

This study aimed to assess the knowledge, attitude and practice regarding CRC and its screening among the adult population (18 years of age and above) living in the state of TN.

The specific research questions were:

1. Is there an association between the knowledge of CRC and SES?
2. Is there an association between the knowledge of CRC and education?
3. Is there a difference in attitude towards CRC and its screening by SES?
4. Is there an association between the willingness for CRC screening and SES?

2. METHODS

2.1 Study design

A cross-sectional survey with telephone interviews was used in this study. Unlike face-to-face interview, telephone interviews allow to complete more interviews in a relatively short period of time. Telephone interviews are more cost-effective than door-to-door survey.

2.2 Study population and setting

The target population included the population of TN who were Jio sim users. Jio sim is the most widely used network in the state. To subscribe to the network, it is mandatory to register a person's Aadhaar number which is a unique identification number provided by the central government of India. Uniqueness of the network lies in its distinctive four digit prefix for the state. Other networks also have a prefix number; however, the prefixes are not unique to specific states.

2.2.1 Inclusion and Exclusion criteria

The inclusion criteria were

1. Being residents of TN,
2. Being 18 years or older.

The reason for including 18 years and above was to compare the knowledge between younger population and the risk group (those 50 years of age and above).

The exclusion criterion was

1. Inability of speaking Tamil language.

2.3 Sample size calculation

Based on the previous studies conducted in different countries^{35,44-46}, the average of standard deviation of knowledge was calculated to be 4.27. To be more conservative, the standard deviation for the purpose of sample size calculation was rounded up and was assumed to be 5.

The sample size was calculated according to the two sample means difference sample size formula:

$$n=2\sigma^2*(Z_{\alpha/2}+Z_{\beta})^2 / (\mu_1-\mu_2)^2$$

Where,

- n = required sample size
- σ = estimated standard deviation of knowledge
- $Z_{\alpha/2} = 1.96$ (the critical value at $\alpha/2$ for a confidence interval of 95% with a normally distributed curve)
- $Z_{\beta} = 0.842$ (the critical value at β for a power of 80% with a normally distributed curve)
- μ_1 = estimated mean (high SES group)
- μ_2 = estimated mean (low SES group)

Assuming 60% of the participants would belong to the high SES group and 40% of the participants would belong to the low SES group, the ratio between the groups was calculated as $0.6/0.4=1.5$.

A difference of mean knowledge score of 2 between the groups was considered for the sample size calculation.

$$n=2*(5)^2*(1.96+0.842)^2/ (2)^2$$

$$n=2*25*7.84/4$$

$$n=98$$

The sample size for one group was 98.

Considering the proportions between the groups are different and assuming ratio would be 1.5, and then the sample size for another group was 147.

So, the estimated sample size was 245.

Assuming the response rate of 80% is the total sample size was calculated to be 307.

$$n=245/0.80 = 307$$

2.4 Sampling strategy

The participants were contacted through random digit dialing. There are ten digit mobile numbers in India. We used the four digit prefix, which was specific to TN and then six numbers were randomly generated using RANDBETWEEN command in Excel. Three attempts were allowed for contacting each participant.

2.5 Survey instrument

After a thorough literature review, the questionnaire was adapted ([appendix 1](#)), taking into consideration the regional context. The questionnaire included the following domains:

➤ Knowledge of CRC

Knowledge about CRC risk factors, signs and symptoms were adopted from the United Kingdom survey which was a validated and standardized instrument.⁴⁶ There were prompted and unprompted questions for the risk factors and signs and symptoms. The

risk factors included 11 questions (1 unprompted and 10 prompted) and the options were given based on a five point Likert scale (strongly agree, agree, not sure, disagree, and strongly disagree) for the prompted questions. Strongly agree and agree responses received 1 point while for disagree, strongly disagree, and not sure responses received 0 point. The signs and symptoms domain included 10 questions (1 unprompted and 9 prompted). Three options were given for the prompted questions (yes, no and don't know). For each 'yes' answer, 1 point was given and for 'no' and 'don't know' 0 point was given. For the unprompted questions, 1 point was given for each correct response. Then, the score ranged from 0 to 10 for risk factors and 0 to 9 for signs and symptoms for unprompted and prompted questions. The correct answers for risk factors were older age, red meat intake, alcohol, low-intake of fruits and vegetables, low fiber intake, family history of CRC, diabetes, low physical activity, overweight and other types of bowel diseases. The correct answers for signs and symptoms were per rectal bleeding, changes in bowel habit, blood in the stool, abdominal or anal pain, diarrhea and constipation, presence of lumps in the abdomen, bowel does not empty, anemia and weight loss without any reason.

➤ Attitude towards CRC and CRC screening

Attitude towards CRC and its screening was based on the Health Belief Model (HBM)^{35,37,45} and self-reported health⁴⁷. The attitude domain included questions on perceived susceptibility (two items), severity (two items), efficacy (one item), and barriers (two items). The response options were strongly agree, agree, don't know, disagree, and strongly disagree. The self-reported health status was collected on a scale of 0 to 10, where 0 indicated poor health and 10 indicated excellent health.

➤ Practice of CRC screening^{37,45}

This section included six questions; visit to general practitioner (yes, no), frequency of visiting general practitioner, willingness to do screening in the future if the participant age is below 50 (yes, no, not sure), CRC screening history in the past if the participant age is 50 or above (yes, no, not sure), reasons for not willing to take the screening (open ended), information about CRC in future (Medical personnel, Television advertisements, Friends/relatives and others) and participant's willingness to pay for screening if the screening program is implemented in TN (open-ended).

➤ Socio-demographic characteristics such as age, gender, marital status, level of education, occupation, monthly income of the family, and family history of cancer and CRC were included.^{35,45,48,49}

The questionnaire was translated into Tamil, the native language of TN, and back translated into English for checking the accuracy of the questions. The questionnaire was pre-tested with seven participants before the data collection. The questionnaire did not require any modification or corrections; the data from these participants were included in the study.

2.6 Data collection

Data was collected after obtaining consent from the participant. Three female interviewers were recruited for the data collection. The interviewers were trained before the data collection. Three training sessions were held for the interviewers. During the first two sessions, interviewers were informed about the consent form, questionnaire, interviewer script (appendix. 2) and managing the records. During the third session, the interviewers were asked to take an interview with each other under the supervision of the student investigator to see the potential errors they make and to address them on the spot. The telephone surveys were conducted

between 11:00 and 20:00 Indian Standard Time (IST). The student investigator collected the completed questionnaires and journal forms from the interviewers at the end of each day.

2.7 Study variables

Dependent variables

1. Knowledge of CRC on risk factors (both unprompted and prompted) was treated as percent mean score.
2. Knowledge of CRC on signs and symptoms (both unprompted and prompted) was treated as percent mean score.
3. Attitude towards CRC and its screening was treated as a categorical variable.
4. Behavior or practice of CRC screening was considered as a binomial variable.

Independent variables

1. Income level was categorized into low and high SES accounting for size of the family. Income below 28,000 INR for a family with size ranging from 1 to 5 members was considered as low SES, whereas income below 41,000 for a family size greater than 5 was considered as low SES. For a family size of 1 to 5 members, income above 28,001 INR was considered as high SES. For a family size greater than 5 members, above 41,000 was considered as high SES.
2. Education level of the participants was collected as a categorical variable.

Demographic factors such as age, gender, occupation, marital status and family history of cancer, family history of CRC, place of residence were considered as covariates. Willingness of getting information about CRC was treated as categorical variable. The amount of money participant was willing to pay for screening was considered as a continuous variable. Age was

treated as continuous variable. Marital status, level of education, average monthly income of the family and occupation were treated as categorical variables.

2.8 Data management and analysis

A single entry was done by the student investigator. The data entry and analysis was done in IBM SPSS Statistics 21. To check for data entry accuracy, 10% of the observations were chosen and compared with their corresponding questionnaires. Range and outlier checks were performed to find and correct potential data entry problems.

Descriptive statistics were presented in terms of frequencies, percentages, means, and standard deviations (SDs). Bivariate analysis such as Chi-squared test, t-test, and analysis of variance (ANOVA) were used for categorical and continuous variables respectively. Univariate linear regression and univariate logistic regression were carried out for the knowledge of CRC and practice of CRC screening to check the relationship with the independent variables respectively.

To find the association between knowledge of CRC risk factors as well as signs and symptoms (prompted) with education and SES, four separate multiple linear regressions adjusting for covariates were carried out. Binomial logistic regression was carried out to find the association between willingness to do screening with SES after adjusting for covariates.

2.9 Ethical considerations

The Institutional Review Board (IRB) of the American University of Armenia approved the study. Ethical issues such as privacy and confidentiality of the study participants were considered while conducting the study. Verbal consent was attained from the study participants before starting the interview ([appendix 3](#)). The journal forms ([appendix 4](#)) which include the

phone numbers of the participants were destroyed one week after the completion of the last interview.

3 RESULTS

Response rate

The target was to identify 307 eligible participants for the study. Around 2689 attempts were made during the telephone survey. Out of 430 persons successfully contacted, 115 persons refused to participate, and 6 persons did not meet the inclusion criteria as they did not speak Tamil language. During the survey, 2 of the participants did not complete the survey fully and they were excluded from the study. The response rate was 72.4% and it was calculated from the number of eligible individuals contacted (424) and those who completed the survey fully (307).

3.1 Descriptive statistics

Characteristics of the study population

Table 1 shows the socio-demographic characteristics of the study participants. The mean age of the participants was 31.56 (SD = 9.8). Almost two-thirds, 64.8% (n=199), of the study participants were males. A large proportion of the participants had an undergraduate degree (40.7%). More than half of the study population were employed (65.1%) and were married (51.5%). There are twelve metropolitan cities (Chennai, Coimbatore, Dindugal, Erode, Madurai, Salem, Thiruchirapalli, Tirunelveli, Tiruppur, Thoothukudi, Tanjore and Vellore) in TN which was considered as urban and the rest of the cities as rural. Almost half of the sample (49.5 %) was from urban areas. Slightly less than half of participants (44.9%) were from low SES group. Among the participants, 28.3% reported a family history of cancer and out of them only 2.3%

(n=7) had a family history of CRC. More than three-quarters of participants (80.5%) reported that they had never heard about CRC.

Knowledge about risk factors

Awareness on risk factors was measured through unprompted and prompted questions (more details under methods section). The most frequently recalled risk factors were “drinking alcohol” (22.8%) followed by the “presence of bowel disease” (8.8%) when they were asked as open ended questions ([table.2](#)). The least frequently recalled risk factor was “DM” (1.0%). Fifty seven percent of the participants could not report any risk factors. Prompted knowledge on CRC risk factors was the highest for “drinking alcohol” (71.3%) followed by the “presence of bowel disease” (59.9%). One in five (19.5%) identifies DM as risk factor for CRC. [Table 2](#) provides further details regarding participants’ response on prompted and unprompted knowledge questions about CRC risk factor.

Knowledge about signs and symptoms

When asked unprompted, the most frequently recalled symptom was “abdominal pain” (30.0%) followed by “unexplained weight loss” (12.7%). The least frequently recalled symptom was “bowel does not empty” (2.3%), and 56.0% of the respondents could not recall any symptoms. [Table 3](#) provides further details about participants’ responses on prompted and unprompted knowledge questions on CRC signs and symptoms.

Attitude towards CRC and its screening

While 55.4 % of the participants strongly disagreed with the statement that they are at “feeling at risk of getting CRC”, 1.6% strongly agreed with that. The majority of the respondents (78.2%) strongly agreed that “CRC can be cured if detected early”. Only 41.4% (including 24.0% strongly agree and 17.4% agree) felt “confident to do a FOBT test at home”.

About 30.0% and 30.6% of the participants strongly agreed and strongly disagreed with the statement feeling “embarrassed to do a colonoscopy”, respectively. Most of the participants disagreed (42.7% strongly disagree and 29% disagree) with the statement “getting cancer means sentenced to death”. [Table 4](#) provides further details on attitude towards CRC and its screening.

Health seeking behavior and practice of CRC screening

More than half of the study participants (57.7%) had visited their doctor during the last twelve months. The mean number of visits to doctors during a year was 3.3 times (SD=2.9). No one from the eligible participants (≥ 50 years of age) attended CRC screening during their lifetime. The amount of money that participants were willing to pay for CRC screening if the program was implemented in TN ranged from 0 to 50,000 INR, with a mean of 1,259 INR ([table 5](#)). Almost half of the participants (45.3%) expressed willingness to get information about CRC from doctors or medical personnel.

3.2 Univariate analysis

Knowledge scores of CRC risk factors and signs and symptoms

The percent mean knowledge score for the prompted questions were higher when compared to the unprompted questions. The mean percent unprompted knowledge scores for risk factors, and signs and symptoms were 8.18 (SD =10.41) and 10.60 (SD =17.36), respectively. The percent mean knowledge scores of risk factors based on the prompted question was 42.80 (SD = 19.49). The percent mean knowledge scores (prompted) of signs and symptoms was 62.65 (SD = 27.48).

Living in an urban area ($p=0.012$), family history of cancer ($p<0.001$), and ever heard of CRC ($p=0.001$) were significantly associated with higher mean percent unprompted knowledge score on risk factors. Older age (50-70 years) ($p=0.032$), being divorced or separated ($p=0.044$),

family history of cancer ($p < 0.001$) and ever heard about CRC ($p < 0.001$) were significantly associated with higher percent mean unprompted knowledge scores on signs and symptoms.

Table 6 presents percent mean scores on knowledge of CRC risk factors and signs and symptoms (unprompted).

Being a student ($p = 0.007$) and being from a high SES group ($p = 0.029$) were statistically significantly associated with the percent mean prompted knowledge scores on risk factors of CRC. More than 12 years of education ($p = 0.002$), high SES ($p = 0.008$), living in an urban area ($p = 0.011$), and ever heard about CRC ($p < 0.001$) characteristics were statistically significantly associated with higher percent mean prompted knowledge scores on signs and symptoms. Table 7 provides further details on prompted percent mean scores on knowledge of CRC risk factors and signs and symptoms.

Attitude towards CRC and its screening

Majority of the respondents in the low and high SES groups reported that they are not at “feeling at risk of getting CRC”. About 54.1% ($n = 60$) in the low SES and 60.3% ($n = 82$) in the high SES group strongly disagreed with the statement “risk of getting CRC in the future” ($p = 0.695$). Only two of the questions attained statistical significance such as, “confident to do FOBT test at home” (low vs. high SES, $p = 0.002$) and “getting cancer means sentenced to death” (low vs. high SES, $p = 0.005$). Interestingly, two third of the participants in the low and high SES group strongly agreed with the statement “CRC can be cured if detected early” and it was insignificant between the groups ($p = 0.447$). Table 8 provides the distribution of attitude towards CRC and its screening among the SES groups.

Practice of CRC screening

None of the eligible participants for screening (≥ 50 years of age) had attended a CRC screening during their lifetime; hence we could not explore its association with the independent variables of interest. Almost three-quarters (71.5%) of participants under 50 years of age were willing to do screening (table.9). The univariate logistic regression analyses among those under 50 years of age found that education, self-reported health, and visit to the general practitioner in the last 12 months were statistically significantly associated with willingness to do CRC screening (table.10). Participants in the high SES group had 38% lower odds to report willingness to do CRC screening. We did not find any statistically significant association between age, gender, marital status, SES, place of the residence, family history of cancer, ever heard of CRC, number of people living in house with willingness to do CRC screening.

3.3 Multivariable models for percent mean knowledge scores

To evaluate the effect of controlled association of SES and education with the percent knowledge scores on risk factors, and sign and symptoms focused on the prompted knowledge scores. In the adjusted model we did not find an association between the percent mean knowledge score on CRC risk factors and the SES ($p=0.074$), education ($p=0.147$ for 0-8 years of education, $p=0.563$ for more than 12 years of education compared to the reference of 9-12 years of education) after controlling for age, gender, education, place of residence and ever heard about CRC, (table. 11). Similarly, in the adjusted model, we did not find an association between the SES and the percent knowledge score on signs and symptoms of CRC ($p=0.206$), nevertheless the adjusted association between education and the percent mean knowledge score on signs and symptoms of CRC were significant ($p=0.966$ for 0-8 years of education, $p=0.001$ for more than 12 years of education compared to the reference of 9-12 years of education) (table. 12)

3.4 Multivariable model for willingness to do CRC screening

As presented in table 13, after adjusting for age, education, occupation, visit to the general practitioner in the last 12 months and self-reported health status, the willingness to do screening was not associated with the level of SES (high SES, OR=0.48, p=0.097).

4. DISCUSSION

The present study described the knowledge of risk factors, signs and symptoms, attitude, and practice of CRC among the adult population in TN. Previous studies conducted in other countries focused on subjects above age of 50 years.^{48,50} This study also included younger participants to enable development of early interventions targeting the younger generation with the hope of preventing CRC.

In this study, 80.5% of the study participants had not heard about CRC, whereas in a study conducted among Western Australians, 78% of the participants had heard about CRC.⁴⁵ This comparison suggested that general awareness of CRC was low among adults living in TN.

In our study, 57% and 56% of the study participants could not name any risk factors and signs and symptoms of CRC, respectively. Lack of knowledge on risk factors and sign and symptoms of CRC were different from a study conducted in Brunei⁴¹ which reported that 36.9% and 56.7% could name any risk factors and signs and symptoms of CRC, respectively. In contrast, the lack of knowledge in our study was quite high when compared to other studies conducted in high income countries such as UK.⁴⁶ A study conducted in the UK found that only 28% and 25% of the participants could not mention any risk factors and signs and symptoms of CRC, respectively.

Awareness of lifestyle risk factors such as consumption of red meat, lack of physical activity and overweight was poor. Both in prompted as well as in the unprompted section, the

awareness of red meat consumption was low (3.6%-unprompted, 38.8%-prompted). These results are consistent with the study conducted in the UK (0.8%-unprompted, 47.4%-prompted).⁴⁶ Forty percent of our study participants identified low physical activity as one of the risk factors, whereas the study conducted in Italy, only 24% of the study participants reported this as a risk factor.⁴⁷ Strikingly, a large proportion of our study participants (71.3%) identified consumption of alcohol as a risk factor for CRC which was similar to Australian participants (70%).⁴⁵ Therefore, it demonstrates that there is a need to educate the people and public health initiatives should be focused to increase the awareness of risk factors and signs and symptoms of CRC.

Unlike other studies suggesting higher knowledge on signs and symptoms among women when compared to men^{46,51}, we did not detect any gender differences in knowledge on signs and symptoms of CRC. Consistent with the study conducted in the UK, we found that those 50 years of age and above had a higher knowledge on signs and symptoms of CRC when compared to the younger population.⁴⁶

Several studies have shown that there is an association between knowledge of CRC risk factors and signs and symptoms with education.^{41,48} However, in our study only the signs and symptoms had an association with the educational levels of the participants. This indicates participants were aware of signs and symptoms when there is increase in educational level. Consistent with other studies^{35,45,48} we did not find an association between the knowledge of CRC (risk factors, signs and symptoms) and SES of the participants.

We found that none of the participants who were 50 years of age and above had ever had CRC screening. This could be due to lack of awareness on CRC and screening programs as well as observed poor knowledge on CRC. Nevertheless, similar to a study conducted in Saudi, about

70.2% of the study participants were willing to do screening for CRC in the future.³⁵ This is suggestive that the younger adults might be more self conscious about health and more likely to go for CRC screening in the future. It is worth noting that a high level of willingness to do CRC screening does not automatically translate into high levels of screening rate among this population when they become eligible for CRC screening (50 years of age and above). In our study, the participants in high SES group were less willingly to do CRC screening when compared to low SES group. A few studies have assessed the association between SES group and willingness to do CRC screening, however, they did not find any statistically significant association.^{52,53} The observed unexpected association in our study could be partially because of high rates of “don’t know/refused to answer” responses on the SES question.

Public health implications should be focused to increase the awareness of CRC among all the age groups. Hence, it would be helpful in reducing morbidity and mortality due to CRC by early diagnosis and treatment.

4.1 Strengths of the study

The study assessed knowledge of CRC among the general adult population in the state of TN. Notably, this was the first study in India as well as in this state that explored the knowledge and perception about CRC in this population. The interviews were done by telephone survey, thereby, reduced the potential social desirability bias. We contacted the participants through the random digit dialing, which increased the likelihood of obtaining a representative of the sample. Another strength of the study was using a validated questionnaire from the UK for assessing the knowledge on CRC risk factors and symptoms.

4.2 Limitations of the study

Several limitations should be noted in the study. The interviews were conducted by three female interviewers which might lead to interviewer bias. However, training of interviewers before the data collection has minimized this bias. Some of the variables such as socioeconomic status were self-reported and were prone to reporting bias and measurement errors. Non-response bias could have contributed to selection bias. The study results cannot be extrapolated to the general population because the selection of the participants was based on Jio numbers.

4.3 Recommendations and conclusions

This study indicated that the knowledge about CRC is low among the study participants. As an effort to improve the knowledge level, many developed countries have initiated awareness programs. Similarly the government of TN has initiated an awareness program focusing on non-communicable diseases including cancer.⁵⁴ However, colon cancer is not one among those cancers that are focused.

The findings from this study can be helpful in engaging different stakeholders, prioritizing the identified issues and developing educational campaigns. To increase the awareness about risk factors, signs and symptoms and screening of CRC, educational campaigns should target the population irrespective of age. Further studies should be conducted in different settings in TN as well as different population groups to assess the barriers contributing to low CRC screening rates in the region.

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Table.1 Descriptive characteristics of the study participants

Variables	Measures
Gender, n (%)	
Male	199 (64.8)
Female	108 (35.2)
Missing responses	Nil
Age, years	
Mean (SD)	31.56 (9.8)
Min – max	18-70
Missing responses	Nil
Education, n (%)	
No formal education	4 (1.3)
Primary school (class 1-5)	3 (1.0)
Middle school (class 6-8)	11 (3.6)
High school (class 9 & 10)	34 (11.1)
Higher secondary/Diploma (11 & 12)	65 (21.2)
College (under-graduate)	125 (40.7)
College (post-graduate)	59 (19.2)
Refused to answer	6 (2.0)
Missing responses	Nil
Occupation, n (%)	
Student	45 (14.7)
Employed	200 (65.1)
Unemployed	52 (16.9)
Retired	3 (1.0)
Refused to answer	5 (1.6)
Missing responses	2 (0.7)
Marital status, n (%)	
Single	136 (44.3)
Married	158 (51.5)
Widowed	3 (1.0)
Divorced/Separated	3 (1.0)
Refused to answer	7 (2.3)
Missing responses	Nil
Average monthly income (INR), n (%)	
< 7000 INR	10 (3.3)
7000 –14,000 INR	27 (8.8)
14,001 – 28,000 INR	66 (21.5)
28,001 – 41,000 INR	61 (19.9)
> 41,000 INR	83 (27.0)
Don't know/Refused to answer	59 (19.2)
Missing responses	1 (0.3)
Place of residence, n (%)	
Urban (metropolitan)	152 (49.5)

Variables	Measures
Rural	155 (50.5)
Number of people living in the household	
Mean (SD)	4.36 (1.7)
Min – max	1 – 12
Missing responses, n (%)	6 (2.0)
Family history of cancer, n (%)	
Yes	87 (28.3)
No	218 (71.0)
Don't know	1 (0.3)
Missing responses	1 (0.3)
Family history of colorectal cancer, n (%)	
Yes	7 (2.3)
No	78 (25.4)
Don't know	2 (0.7)
Missing responses	220 (71.7)
Personal history of colorectal cancer, n (%)	
Yes	Nil
No	7 (2.3)
Missing responses	300 (97.7)
Self reported health, 1 (very bad) to 10 (excellent)	
Mean (SD)	7.36 (1.6)
Missing responses, n (%)	4 (1.3)
Heard of colorectal cancer, n (%)	
Yes	60 (19.5)
No	247 (80.5)
Missing responses	Nil

Table. 2 Awareness of Colorectal cancer risk factors (unprompted and prompted)

Risk factor	Study participants (n=307)	
	Unprompted, n (%)	Prompted*, n (%)
Drinking alcohol	70 (22.8)	219 (71.3)
Low fruits and vegetables consumption	18 (5.9)	125 (40.7)
Consumption of red meat	11 (3.6)	119 (38.8)
Low fiber	13 (4.2)	144 (46.9)
Overweight	4 (1.3)	118 (38.4)
Older age	4 (1.3)	88 (28.7)
Family/relative with colorectal cancer	19 (6.2)	136 (44.3)
Low physical activity	8 (2.6)	121 (39.4)
Bowel disease	27 (8.8)	184 (59.9)
Diabetes	3 (1.0)	60 (19.5)
Don't know	175 (57.0)	

*Prompted is a closed ended questions which were asked to all the participants, even they answered for unprompted one. So, it was based on the entire sample

Table. 3 Awareness of Colorectal cancer signs and symptoms (unprompted and prompted)

Signs and symptoms	Study participants (n=307)	
	Unprompted, n (%)	Prompted*, n (%)
Per rectal bleeding	38 (12.4)	209 (68.1)
Abdominal pain	92 (30.0)	230 (74.9)
Change in bowel habits	19 (6.2)	183 (59.6)
Bowel does not empty	7 (2.3)	152 (49.5)
Blood in the stools	36 (11.7)	205 (66.8)
Anal pain	26 (8.5)	196 (63.8)
Lump in the abdomen	17 (5.5)	196 (63.8)
Tiredness/anemia	19 (6.2)	166 (54.1)
Unexplained weight loss	39 (12.7)	194 (63.2)
Don't know	172 (56.0)	

*Prompted is a closed ended questions which were asked to all the participants, even they answered for unprompted one. So, it was based on the entire sample.

Table. 4 Participant's attitude towards Colorectal cancer and its screening, n=307

Questions	Strongly agree, n (%)	Agree, n (%)	Neither agree nor disagree, n (%)	Disagree, n (%)	Strongly disagree, n (%)	Missing responses, n (%)
Feeling at risk of getting colorectal cancer	5 (1.6)	10 (3.3)	13 (4.2)	109 (35.5)	170 (55.4)	Nil
Concerned about colorectal cancer	12 (3.9)	17 (5.5)	11 (3.6)	109 (35.5)	158 (51.5)	Nil
Colorectal cancer can be cured if detected early	240 (78.2)	33 (10.7)	13 (4.2)	9 (2.9)	12 (3.9)	Nil
Thought of colorectal cancer scares me	21 (6.8)	23 (7.5)	16 (5.2)	104 (33.9)	141 (45.9)	2 (0.7)
Confident to do FOBT test at home	73 (24.0)	53 (17.4)	56 (18.4)	56 (18.4)	66 (21.7)	Nil
Getting cancer means sentenced to death	32 (10.4)	32 (10.4)	18 (5.9)	89 (29.0)	131 (42.7)	5 (1.6)
Embarrassed to do a colonoscopy	92 (30.0)	54 (17.6)	15 (4.9)	52 (16.9)	94 (30.6)	Nil

Table. 5 Health seeking behavior and practice of colorectal cancer screening among the study participants

Variables	Measures
Visit to the general practitioner in last 12 months, n (%)	
Yes	177 (57.7)
No	130 (42.3)
Frequency of doctor visits	
Mean (SD)	3.3 (2.9)
Min – max	1 – 20
Ever been attended for screening (≥50 years), n (%)	
Yes	Nil
No	15 (100.0)
Willing to do screening in the future (<50 years), n (%)	
Yes	205 (70.2)
No	87 (29.8)
Reasons for not attended the screening (≥50 years), n (%)	
Being healthy	9 (60.0)
Do not know about screening	6 (40.0)
Reasons for not willing to do screening (<50 years), n (%)	
Being healthy	73 (84.9)
High cost	1 (1.2)
Fear to do screening	5 (5.8)
Afraid of consequences	2 (2.3)
Do not know about screening	4 (4.7)
No use of screening	1 (1.2)
Amount willing to pay for screening (INR)*	
Mean (SD)	1258.4 (3321.5)
Min – max	0 – 50,000
Information about colorectal cancer in the future, n (%)	
Doctors/Medical personnel	139 (45.3)
Friends/Relatives	25 (8.1)
Television/Newspaper/Radio	97 (31.6)
Don't need the information	3 (1.0)
Literature review	1 (0.3)
Social network	40 (13.2)
No idea	1 (0.3)

* INR - Indian Rupee

Table. 6 Percent knowledge scores on risk factors and symptoms of Colorectal cancer (ANOVA test) – Unprompted

Variables	No.	Percent mean knowledge score on risk factors		Percent mean knowledge score Signs and symptoms	
		Mean % score (SD)	p value ¹	Mean % score (SD)	p value ¹
Age (years)					
18-29	152	7.23 (10.43)	(ref)	9.64 (14.95)	(ref)
30-49	136	8.82 (10.18)	0.197	10.53 (17.76)	0.663
50-70	19	11.05 (11.50)	0.132	18.71 (28.46)	0.032
Gender					
Male	199	7.63 (10.24)	0.220	10.32 (17.03)	0.707
Female	108	9.17 (10.69)	(ref)	11.11 (18.04)	(ref)
Level of education ²					
8 years or less	18	4.44 (5.11)	0.226	1.23 (3.59)	0.073
9-12 years	99	7.67 (8.55)	(ref)	9.20 (16.80)	(ref)
More than 12 years	184	8.75 (11.59)	0.408	12.32 (18.33)	0.150
Occupation					
Student	45	8.22 (14.82)	0.873	10.61 (16.74)	0.954
Employed	200	8.50 (9.81)	(ref)	10.78 (17.11)	(ref)
Unemployed	52	7.12 (8.71)	0.398	10.04 (16.94)	0.781
Retired	3	10.00 (0.00)	0.806	0.00 (0.00)	0.276
Refused to answer	5	8.00 (8.37)	-	17.78 (39.75)	-
Marital status					
Single	136	7.97 (11.32)	0.617	10.46 (16.87)	0.756
Married	158	8.48 (9.72)	(ref)	9.84 (16.68)	(ref)
Widowed	3	16.67 (11.54)	0.181	25.93 (23.13)	0.102
Divorced/Separated	3	3.33 (5.77)	0.400	29.62 (12.83)	0.044
Refused to answer	7	5.71 (7.87)	-	15.87 (33.24)	-
Socio-economic status ³					
Low	111	7.21 (8.76)	(ref)	8.71 (15.31)	(ref)
High	136	8.53 (11.52)	0.320	12.17 (17.73)	0.106
Place of residence					
Urban (metropolitan)	152	9.67 (8.61)	0.012	11.99 (19.29)	0.167
Rural	155	6.71 (11.82)	(ref)	9.24 (15.19)	(ref)
Family history of cancer					
Yes	87	11.84 (14.34)	<0.001	17.11 (21.15)	<0.001
No	218	6.67 (7.93)	(ref)	7.90 (14.76)	(ref)
Don't know	1	20.00 (0.00)	-	44.4 (0.00)	-
Family history of Colorectal cancer					

Variables	No.	Percent mean knowledge score on risk factors		Percent mean knowledge score Signs and symptoms	
		Mean % score (SD)	p value ¹	Mean % score (SD)	p value ¹
Yes	7	18.66 (17.74)	0.177	27.04 (25.11)	0.202
No	78	11.02 (13.77)	(ref)	16.26 (18.53)	(ref)
Don't know	2	20.03 (28.20)	-	16.75 (21.28)	-
Heard about colorectal cancer					
Yes	60	12.33 (13.06)	0.001	18.51 (22.84)	<0.001
No	247	7.16 (9.41)	(ref)	8.68 (15.19)	(ref)
No. of people living in household					
1-5	257	8.17 (10.50)	(ref)	10.42 (18.13)	(ref)
6 and above	44	7.72 (10.08)	0.795	9.85 (16.68)	0.836
Health status					
0-5	35	6.28 (7.31)	(ref)	8.57 (12.53)	(ref)
6-10	268	8.24 (10.54)	0.287	10.74 (17.53)	0.480

¹ p-value were obtained from Univariate linear regression

² Based on the literature review, the education categories were combined into three categories (8 years or less, 9-12 years & more than 12 years of education)

³ Income level was categorized into low and high SES accounting for size of the family. Income below 28,000 INR for a family with size ranging from 1 to 5 members was considered as low SES, whereas income below 41,000 for a family size greater than 5 was considered as low SES. For a family size of 1 to 5 members, income above 28,001 INR was considered as high SES. For a family size greater than 5 members, above 41,000 was considered as high SES.

Refused to answer options were considered as missing values in the Univariate analysis

p –value < 0.05 was considered as significant

Table. 7 Percent knowledge scores on risk factors and symptoms of Colorectal cancer (ANOVA test) – Prompted

Variables	No.	Percent mean knowledge score on risk factors		Percent mean knowledge score Signs and symptoms	
		Mean (SD)	p value ¹	Mean (SD)	p value ¹
Age (years)					
18-29	152	41.91 (18.62)	(ref)	60.31 (28.32)	(ref)
30-49	136	43.31 (20.18)	0.544	64.71 (26.56)	0.176
50-70	19	46.32 (21.65)	0.354	66.67 (26.96)	0.342
Gender					
Male	199	42.11 (20.09)	0.400	61.75 (28.67)	0.439
Female	108	44.07 (18.34)	(ref)	64.30 (25.19)	(ref)
Level of education ²					
8 years or less	18	36.67 (21.96)	0.260	54.94 (35.03)	0.865
9-12 years	99	42.32 (21.65)	(ref)	56.12 (27.09)	(ref)
More than 12 years	184	43.80 (18.09)	0.544	66.73 (26.09)	0.002
Occupation					
Student	45	36.00 (18.99)	0.007	62.22 (27.66)	0.789
Employed	200	44.55 (19.61)	(ref)	63.44 (26.84)	(ref)
Unemployed	52	41.92 (18.05)	0.381	59.62 (31.04)	0.375
Retired	3	43.33 (15.27)	0.913	44.44 (22.22)	0.239
Refused to answer	5	48.00 (28.63)	-	68.89 (14.49)	-
Marital status					
Single	136	42.86 (18.65)	0.941	62.17 (28.25)	0.898
Married	158	43.04 (20.19)	(ref)	62.59 (27.63)	(ref)
Widowed	3	56.67 (25.17)	0.232	62.96 (6.42)	0.982
Divorced/Separated	3	23.33 (20.82)	0.085	70.37 (6.42)	0.631
Refused to answer	7	38.57 (14.63)	-	69.84 (21.96)	-
Socio-economic status³					
Low	111	41.65 (18.95)	(ref)	59.33 (30.07)	(ref)
High	136	45.42 (19.36)	0.029	66.20 (25.81)	0.008
Place of residence					
Urban(metropolitan)	152	41.97 (18.23)	0.462	66.67 (24.50)	0.011
Rural	155	43.61 (20.76)	(ref)	58.71 (29.69)	(ref)
Family history of cancer					
Yes	87	40.57 (18.51)	0.199	66.92 (27.89)	0.095
No	218	43.76 (19.89)	(ref)	61.11 (27.20)	(ref)
Don't know	1	30.00 (00.00)	-	66.67 (0.00)	-
Family history of colorectal cancer					

Variables	No.	Mean (SD)	p value ¹	Mean (SD)	p value ¹
Yes	7	42.86 (17.04)	0.773	68.25 (19.69)	0.917
No	78	40.76 (18.36)	(ref)	67.09 (28.68)	(ref)
Don't know	2	25.00 (35.36)	-	55.56 (31.43)	-
Heard about Colorectal cancer					
Yes	60	46.83 (17.89)	0.074	74.63 (23.42)	<0.001
No	247	41.82 (19.76)	(ref)	59.74 (27.66)	(ref)
No. of people living in household					
1-5	257	43.31 (19.19)	(ref)	62.30 (26.69)	(ref)
6 and above	44	38.64 (21.09)	0.143	63.38 (32.11)	0.810
Health status					
0-5	35	46.57 (20.71)	(ref)	60.63 (25.47)	(ref)
6-10	268	42.35 (19.35)	0.230	63.02 (27.75)	0.630

¹ p-value were obtained from Univariate linear regression

² Based on the literature review, the education categories were combined into three categories (8 years or less, 9-12 years & more than 12 years of education)

³ Income level was categorized into low and high SES accounting for size of the family. Income below 28,000 INR for a family with size ranging from 1 to 5 members was considered as low SES, whereas income below 41,000 for a family size greater than 5 was considered as low SES. For a family size of 1 to 5 members, income above 28,001 INR was considered as high SES. For a family size greater than 5 members, above 41,000 was considered as high SES

Refused to answer options were considered as missing values in the Univariate analysis

p-value < 0.05 was considered as significant

Table. 8 Attitude towards colorectal cancer and screening among the level of Socio-economic status (Low vs High) using Chi-square test

Questions	Low Socio-economic status, n=111					High Socio-economic status, n=136					p-value
	Strongly agree, n (%)	Agree, n (%)	Neither agree nor disagree, n (%)	Disagree, n (%)	Strongly disagree, n (%)	Strongly agree, n (%)	Agree, n (%)	Neither agree nor disagree, n (%)	Disagree, n (%)	Strongly disagree, n (%)	
Feeling at risk of getting colorectal cancer	3 (2.7)	4 (3.6)	3 (2.7)	41 (36.9)	60 (54.1)	2 (1.5)	5 (3.7)	6 (4.4)	41 (30.1)	82 (60.3)	0.695*
Concerned about colorectal cancer	7 (6.3)	5 (4.5)	1 (0.9)	41 (36.9)	57 (51.4)	3 (2.2)	8 (5.9)	7 (5.1)	39 (28.7)	79 (58.1)	0.075*
Colorectal cancer can be cured if detected early	78 (70.3)	18 (16.2)	5 (4.5)	4 (3.6)	6 (5.4)	108 (79.4)	13 (9.6)	7 (5.1)	3 (2.2)	5 (3.7)	0.447*
Thought of colorectal cancer scares me	6 (5.4)	6 (5.4)	6 (5.4)	42 (37.8)	51 (45.9)	11 (8.1)	10 (7.4)	6 (4.4)	38 (28.1)	70 (51.9)	0.502
Confident to do FOBT test at home	19 (17.1)	30 (27.0)	14 (12.6)	24 (21.6)	24 (21.6)	24 (17.8)	12 (8.9)	34 (25.2)	29 (21.5)	36 (26.7)	0.002
Getting cancer means sentenced to death	14 (12.8)	17 (15.6)	7 (6.4)	33 (30.3)	38 (34.9)	12 (9.0)	9 (6.7)	9 (6.7)	26 (19.4)	78 (58.2)	0.005
Embarrassed to do a colonoscopy	30 (27.0)	21 (18.9)	3 (2.7)	20 (18.0)	37 (33.3)	40 (29.4)	21 (15.4)	8 (5.9)	25 (18.4)	42 (30.9)	0.712*

* Fisher's exact test was used because some of the cell size count was less than 5. Pearson chi square test was used for rest of the variable.

Table. 9 Practice of Colorectal cancer screening among participants with high and low SES levels using Chi-square test

Variables	Low Socio-economic status, n=111		High Socio-economic status, n=136		p value
	No.	Percentage (%)	No.	Percentage (%)	
Ever done screening (≥ 50 years of age)					Constant*
Yes	Nil	Nil	Nil	Nil	
No	7	53.8	6	46.2	
Willing to do screening (<50 years of age)					0.094
Yes	68	65.4	98	75.4	
No	36	34.6	32	24.6	

* No statistics were computed because there were no responses in one of the option, so it was a constant

Pearson Chi-square was used

p-value < 0.05 was considered as significant

Table 10. Univariate logistic regression between willingness to do screening and all other independent variables

Variables	Adjusted odds ratio	95% Confidence interval		p-value
		Lower	Upper	
Age (years)				
18-29	(ref)			
30-49	1.21	0.73	2.01	0.459
50-70	2.62	0.36	19.20	0.343
Gender				
Male	1.30	0.76	2.24	0.324
Female	(ref)			
Level of education				
8 years or less	3.55	1.15	10.94	0.028
9-12 years	(ref)			
More than 12 years	2.15	1.15	4.02	0.016
Occupation ^a				
Student	0.31	0.12	0.75	0.011
Employed	(ref)			
Unemployed/ Retired	0.79	0.40	1.58	0.511
Marital status ^b				
Single	0.92	0.09	9.09	0.941
Married	(ref)			
Divorced/widowed/separated	0.70	0.07	6.93	0.762
Socio-economic status				
Low	(ref)			
High	0.62	0.35	1.09	0.095
Place of residence				
Urban	1.05	0.63	1.74	0.838
Rural	(ref)			
Family history of cancer				
Yes	0.63	0.35	1.15	0.131
No	(ref)			
Family history of colorectal cancer				
Yes	5.53	0.85	35.98	0.073
No	(ref)			
Heard about colorectal cancer				
Yes	1.18	0.63	2.22	0.598
No	(ref)			
No. of people living				

Variables	Adjusted odds ratio	95% Confidence interval		p-value
in household				
1-5	(ref)			
6 and above	1.09	0.52	2.24	0.819
Health status				
0-5	(ref)			
6-10	0.23	0.07	0.79	0.020
Visit to the general practitioner in last 12 months				
Yes	0.47	0.28	0.79	0.005
No	(ref)			

^a Unemployed and retired were combined together for this analysis due to small numbers in those categories.

^b Divorced, widowed and separated were combined together for this analysis due to less number of participants

p-value < 0.05 was considered as significant

Table.11 Multivariable linear regression for the association between knowledge of CRC risk factors and independent variables (prompted)

Variables	Regression coefficient	95% Confidence interval		p-value
		Lower	Upper	
SES¹				
Low	(ref)			
High	4.73	-0.47	9.94	0.074
Level of education ²				
8 years or less	-7.41	-17.45	2.62	0.147
9-12 years	(ref)			
More than 12 years	1.44	-3.44	6.32	0.563

¹ Variables such as Age, gender, education, place of residence and heard of colorectal cancer were controlled during the analysis

² Variables such as Age, gender, place of residence and heard of colorectal cancer were controlled during the analysis
p-value < 0.05 was considered as significant

Table. 12 Multivariable linear regression for the association between knowledge of CRC-signs and symptoms and independent variables (prompted)

Variables	Regression coefficient ¹	95% Confidence interval		p-value
		Lower	Upper	
SES¹				
Low	(ref)			
High	4.58	-2.53	11.70	0.206
Level of education ²				
8 years or less	0.29	-13.21	13.80	0.966
9-12 years	(ref)			
More than 12 years	11.29	4.72	17.86	0.001

¹ Variables such as Age, gender, education, place of residence and heard of colorectal cancer were controlled during the analysis

² Variables such as Age, gender, place of residence and heard of colorectal cancer were controlled during the analysis

p-value < 0.05 was considered as significant

Table. 13 Association between willingness to do colorectal cancer screening among the level of socio-economic status of the participants after controlling the variables using binomial logistic regression

Variables	Adjusted odds ratio	95% Confidence interval		p-value
		Lower	Upper	
SES¹				
Low	(ref)			
High	0.48	0.29	1.11	0.097

¹ Variables such as age, education, occupation, visits to general practitioner in the last 12 months, and self-reported health status of the participant were controlled during the analysis

p –value < 0.05 was considered as significant

APPENDIX 1 SURVEY QUESTIONNAIRE (ENGLISH)

A survey of Knowledge, Attitude and Practice of colorectal cancer among adult population

(18 years and above) in Tamil Nadu, India

Participant's ID _____ Start time _____:

Date of Interview (Day/Month/Year) ____/____/____ End time _____:

SCREENING FORM

1. Gender of the participant (If you are sure about the gender, please mark and move to the next question)

1) Male

2) Female

2. From which district you are? _____

3. What is your current age? _____ (years)

4. Do you speak and understand Tamil?

1) Yes (Go to question 5)

2) No (End of the interview)

Section-1 Socio-demographic

5. What is the highest level of education you have completed?

1) No formal education

2) Primary school (1st grade to 5th grade)

3) Middle school (6th grade to 8th grade)

4) High school (9th grade and 10th grade)

5) Higher secondary/ Diploma (11th/12th grade or 2 year study after 10th grade)

- 6) College (Under graduate)
- 7. College (Post-graduate)
- 99) Refusal

6. Currently, what is your occupation?

- 1) Student
- 2) Employed
- 3) Unemployed
- 4) Retired
- 5) Others_____
- 99) Refused to answer

7. What is your marital status?

- 1) Single
- 2) Married
- 3) Widowed
- 4) Divorced/Separated
- 99) Refused to answer

8. How many people live in your family, including you? _____

9. How much is your monthly family income on average?

- 1) Less than 7000 INR
- 2) From 7000 to 14,000 INR
- 3) From 14,001 to 28,000 INR
- 4) From 28,001 to 41,000 INR
- 5) Above 41,001 INR

88) Don't know/Refuse to answer

10. Has anyone in your family ever had a history of cancer? (family includes parents, siblings, grandparents, nephew and uncles)

1) Yes

2) No (**Go to question 13**)

88) Don't know (**Go to question 13**)

11. Has anyone in your family ever been diagnosed with colorectal cancer? (family includes parents, siblings, grandparents, nephew and uncles)

1) Yes

2) No (**Go to question 13**)

88) Don't know (**Go to question 13**)

12. Do you have a personal history of colorectal cancer?

1) Yes

2) No

13. How would you rate your current health status on a scale of 1 to 10 with 1 bad and 10 excellent(From 1 to 10) _____

14. Have you heard about colorectal cancer?

1) Yes

2) No

Section-2 Knowledge of Colorectal cancer

Risk factors of colorectal cancer

15. To your knowledge, what are the risk factors for developing colorectal cancer? (**This is an open ended question and the interviewer should mark the answer based on participant's response**)

Risk factors	
<input type="checkbox"/> 1) Drinking alcohol	<input type="checkbox"/> 8) Not doing enough exercise
<input type="checkbox"/> 2) Eating less fruits and vegetables	<input type="checkbox"/> 9) Having a bowel disease
<input type="checkbox"/> 3) Eating red meat	<input type="checkbox"/> 10) Having diabetes (sugar)
<input type="checkbox"/> 4) Not eating enough fiber	<input type="checkbox"/> 11) Others
<input type="checkbox"/> 5) Being overweight	<input type="checkbox"/> 12) Nothing
<input type="checkbox"/> 6) Older age	<input type="checkbox"/> 99) Refusal
<input type="checkbox"/> 7) Family history/relatives with cancer	<input type="checkbox"/> 88) Don't know

16. The following may or may not increase a person's chance of developing bowel cancer. How much do you agree that each of these can increase a person's chance of developing bowel cancer?

	Strongly agree	Agree	Neither agree, nor disagree	Disagree	Strongly disagree
1. Drinking more than 1 unit of alcohol a day	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
2. Eating less than 5 portions of fruit and vegetables a day	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
3. Eating red meat once a day or more	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
4. Having a diet low in fiber	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
5. Being overweight (BMI over 25)	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
6. Being over 70 years old	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
7. Having a close relative with bowel cancer	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
8. Doing less than 30 minutes of moderate physical activity 5 times a week	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
9. Having a bowel disease (e.g. Ulcerative colitis, Crohn's disease)	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
10. Having diabetes	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5

Signs and symptoms

17. To your knowledge, what are the warning signs and symptoms of bowel cancer? Please name as many as you can think of: **(This is an open ended question and the interviewer should mark the answer based on participant's response)**

Warning signs and symptoms	
<input type="checkbox"/> 1) Per rectal bleeding	<input type="checkbox"/> 8) Tiredness/anemia
<input type="checkbox"/> 2) Abdominal pain	<input type="checkbox"/> 9) Weight loss
<input type="checkbox"/> 3) Change in bowel habits	<input type="checkbox"/> 10) Others
<input type="checkbox"/> 4) Bowel not emptying	<input type="checkbox"/> 11) Nothing
<input type="checkbox"/> 5) Blood in stools	<input type="checkbox"/> 99) Refusal
<input type="checkbox"/> 6) Anal pain	<input type="checkbox"/> 88) Don't know
<input type="checkbox"/> 7) Lump	

18. The following may or may not be the warning signs for bowel cancer. We are interested in your opinion:

Warning signs and symptoms	Yes	No	Don't know
1. Do you think per rectal bleeding could be a sign of colorectal cancer?	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 88
2. Do you think abdominal or anal pain is a sign of colorectal cancer?	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 88
3. Do you think a change in bowel habits (diarrhea, constipation or both) over a period of weeks could be a sign of colorectal cancer?	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 88
4. Do you think a feeling that your bowel does not completely empty after using the lavatory could be a sign of colorectal cancer?	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 88
5. Do you think blood in the stools could be a sign of colorectal cancer?	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 88
6. Do you think the pain in your back passage could be a sign of colorectal cancer?	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 88

7. Do you think a lump in your abdomen (tummy) could be a sign of colorectal cancer?	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 88
8. Do you think that tiredness/anemia could be a sign of colorectal cancer?	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 88
9. Do you think unexplained weight loss could be a sign of colorectal cancer?	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 88

Section-3 Attitude towards CRC and CRC screening

	Strongly Agree	Agree	Neither agree nor disagree	Disagree	Strongly Disagree
<i>Perceived Susceptibility</i>	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
19. I think that I am at risk of getting bowel cancer or CRC	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
20. I am concerned about getting bowel cancer in the future.	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
<i>Perceived Severity</i>	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
21. CRC can be cured if detected early.	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
22. The thought of bowel cancer scares me.	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
<i>Perceived Efficacy</i>	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
23. I am confident to do FOBT test* in my home	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
<i>Perceived Benefits/Barriers</i>	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
24. Getting cancer means sentenced to death	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
25. I would feel embarrassed to do a colonoscopy**.	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5

*FOBT is a test to detect the blood in the stool which might indicate colorectal cancer. However, not all cancer cases bleed

**Colonoscopy is an exam to detect any abnormalities in the colon and rectum.

Section-4 Practice

26. In the last twelve months, did you visit your general practitioner?

1) Yes _____ (specify how many times)

2) No

27. Have you ever been screened for CRC? (**Ask if the participant's age is ≥ 50**)

1) Yes (**Go to question 30**)

2) No (**Go to question 29**)

28. Are you willing to do CRC screening in the future? (**Ask if the participant's age is < 50**)

1) Yes (**Go to question 30**)

2) No (**Go to question 29**)

88) Don't know

29. Reasons for not willing to do CRC screening/ not attended the screening (**This question will be an open ended to the participants and the interviewers should mark the answer based on participant's response**)

1) Being healthy, so I do not want to do screening

2) High cost

3) Fear to do screening

4) Afraid of consequences of being screened

5) Going to work

6) Household work and taking care of children

7) I do not know about screening

8) Others_____

30. How much would you like to pay for CRC screening, if the screening program is implemented in Tamil Nadu? _____

31. From where do you want to get any information about CRC in the future?

1) Doctors/ Medical personnel

2) Friends/Relatives

3) Television/Radio/Newspaper

4) Others_____

Thank you for the participation.

இணைப்பு 1. கருத்தாய்வு கேள்வித்தாள் (Tamil version)

பெருங்குடல் மற்றும் மலக்குடல் புற்றுநோயின் அறிவு, மனப்பான்மை மற்றும் பயிற்சி பற்றிய ஆய்வு

18 வயது மற்றும் அதற்கு மேற்பட்டவர், தமிழ்நாடு, இந்தியா

பங்கேற்பாளர் அடையாள எண் _____ ஆரம்பிக்கும் நேரம் ____:____

தேதி (நாள்/மாதம்/ஆண்டு) ____/____/____ முடிவு நேரம் ____:____

பரிசோதனை கேள்விகள்

1. பங்கேற்பாளரின் பாலினம் (நீங்கள் பாலினம் பற்றி உறுதியாக இருந்தால், தயவுசெய்து அதை குறிப்பிட்டு பின்னர் அடுத்த கேள்வியை கேட்கவும்)

1) ஆண்

2) பெண்

2. நீங்கள் எந்த மாவட்டத்தைச் சேர்ந்தவர்? _____

3. உங்களின் தற்போதைய வயது என்ன? ____ (ஆண்டுகள்)

4. உங்களால் தமிழில் பேசவும் புரிந்து கொள்ளவும் முடியுமா?

1) ஆம் (கேள்வி 5 க்கு செல்லவும்)

2) இல்லை (நேர்காணலின் முடிவு)

பிரிவு-1 சமூக பொருளாதார நிலை

5. உங்கள் உயர்ந்த கல்வியின் நிலை என்ன?

1) கல்வி பயின்றதில்லை / படிப்பறிவில்லை

2) ஆரம்பநிலை பள்ளி (1-5 வகுப்பு)

3) நடுநிலைப்பள்ளி (6-8 வகுப்பு)

4) உயர்நிலைப்பள்ளி (9-10 வகுப்பு)

5) மேல்நிலை / டிப்ளோமா (11-12 வகுப்பு)

6) கல்லூரி (இளங்கலை பட்டப்படிப்பு)

7) கல்லூரி (முதுகலை பட்டப்படிப்பு)

99) பதில் சொல்ல விரும்பவில்லை

6. உங்களுடைய தற்போதைய தொழில் என்ன?

1) மாணவர்

2) ஊழியர்

3) வேலையற்றோர்

4) ஓய்வுபெற்றோர்

5) மற்றவை _____

99) பதில் சொல்ல விரும்பவில்லை

7. உங்கள் திருமண நிலை என்ன?

- 1) திருமணமாகாதவர்
- 2) திருமணமானவர்
- 3) விதவை
- 4) விவாகரத்து / பிரிந்த நபர்
- 99) பதில் சொல்ல விரும்பவில்லை
8. உங்கள் குடும்பத்தில் எத்தனை பேர் வாழ்கிறார்கள், நீங்கள் உட்பட? _____
9. உங்களது குடும்பத்தின் தோராயமான மாத வருமானம் எவ்வளவு?
- 1) 7000 INR -கும் குறைவு
- 2) 7001 முதல் 14,000 INR வரை
- 3) 14,001 முதல் 28,000 INR வரை
- 4) 28,001 முதல் 41,000 INR வரை
- 5) 41,001 INR க்கு மேல்
- 88) எனக்கு தெரியாது/ பதில் சொல்ல விரும்பவில்லை
10. உங்கள் குடும்பத்தில் (பெற்றோர், உடன்பிறப்புகள், தாத்தா, பாட்டி, மருமகன் மற்றும் மாமாக்கள்) உள்ள எவருக்கேனும் புற்றுநோய் உள்ளது என்று கண்டறியப்பட்டுள்ளதா?
- 1) ஆம்
- 2) இல்லை (கேள்வி 13 க்கு செல்லவும்)
- 88) எனக்கு தெரியாது (கேள்வி 13 க்கு செல்லவும்)
11. உங்கள் குடும்பத்தில் (பெற்றோர், உடன்பிறப்புகள், தாத்தா, பாட்டி, மருமகன் மற்றும் மாமாக்கள்) உள்ள எவருக்கேனும் பெருங்குடல் மற்றும் மலக்குடல் புற்றுநோய் உள்ளது என்று கண்டறியப்பட்டுள்ளதா?
- 1) ஆம்
- 2) இல்லை (கேள்வி 13 க்கு செல்லவும்)
- 88) எனக்கு தெரியாது (கேள்வி 13 க்கு செல்லவும்)
12. உங்களுக்கு பெருங்குடல் மற்றும் மலக்குடல் புற்றுநோய் உள்ளது என்று கண்டறியப்பட்டுள்ளதா?
- 1) ஆம்
- 2) இல்லை
13. உங்கள் உடலின் உடல்நிலை/சுகாதார நிலையை, 1 முதல் 10 வரையிலான அளவுகோலில், எவ்வளவு மதிப்பிடுவீர்கள்? _____
14. பெருங்குடல் மற்றும் மலக்குடல் புற்றுநோயைப் பற்றி நீங்கள் எப்போதாவது கேட்டிருக்கிறீர்களா?
- 1) ஆம்

2) இல்லை

பிரிவு-2 பெருங்குடல் மற்றும் மலக்குடல் புற்றுநோய் அறிவு

பெருங்குடல் மற்றும் மலக்குடல் புற்றுநோயின் ஆபத்து காரணிகள்

15. உங்களை பொறுத்தவரை பெருங்குடல் மற்றும் மலக்குடல் புற்றுநோயை உருவாக்கும் ஆபத்து காரணிகள் யாவை? (இது ஒரு திறந்த முடிவான கேள்வி, பங்கேற்பாளரின் பதிலின் அடிப்படையில் பதிலைக் குறிக்க வேண்டும்)

ஆபத்து காரணிகள்	
<input type="checkbox"/> 1) மது குடிப்பது	<input type="checkbox"/> 8) போதுமான உடற்பயிற்சி செய்யாததால்
<input type="checkbox"/> 2) குறைந்த பழங்கள் மற்றும் காய்கறிகள் சாப்பிடுவது	<input type="checkbox"/> 9) குடல் நோய் இருப்பது
<input type="checkbox"/> 3) சிவப்பு இறைச்சி உண்ணுதல்/உட்கொள்வது	<input type="checkbox"/> 10) சர்க்கரை நோயுடன் இருத்தல்
<input type="checkbox"/> 4) போதுமான நார்ச்சத்து உட்கொள்ளாததால்	<input type="checkbox"/> 11) மற்றவை
<input type="checkbox"/> 5) அதிக உடல் எடையுடன் இருத்தல்	<input type="checkbox"/> 12) எதுவுமில்லை
<input type="checkbox"/> 6) முதுமை	<input type="checkbox"/> 99) பதில் சொல்ல விரும்பவில்லை
<input type="checkbox"/> 7) புற்றுநோய் குடும்ப வரலாறு	<input type="checkbox"/> 88) எனக்கு தெரியாது

16. கீழ்காணும் குறிப்புகளில் பெருங்குடல் மற்றும் மலக்குடல் புற்றுநோய் ஏற்படுவதற்கான ஒரு நபரின் வாய்ப்பு அதிகரிக்கலாம் அல்லது அதிகரிக்காமலும் இருக்கலாம். அதை பற்றி நீங்கள் எந்த அளவிற்கு ஏற்றுக்கொள்கிறீர்கள் அல்லது ஏற்றுக்கொள்ளவில்லை என்பதை கீழே கொடுக்கப்பட்டுள்ள அறிக்கைகள் மூலம் விவரிக்கவும்.

	வலுவாக ஒப்புக்கொள்கிறேன்	ஒப்புக்கொள்கிறேன்	உடன்படவில்லை அல்லது கருத்து வேறுபாடு இல்லை	ஒப்புக்கொள்ளவில்லை	வலுவாக ஒப்புக்கொள்ளவில்லை
1. ஒரு நாளைக்கு 1 அலகிற்கு மேல் மதுபானம் குடிப்பது	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
2. நாள் ஒன்றுக்கு 5-க்கும் குறைவான பழம் மற்றும்	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5

காய்கறிகள் உட்கொள்வது					
3. தினசரி 1 முறை அல்லது அதற்குமேல் சிவப்பு இறைச்சி உண்ணுவது	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
4. நார்ச்சத்து குறைவாக உள்ள உணவை உட்கொள்வது	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
5. உடல் பருமன் அதிகமாக இருத்தல் (BMI 25 க்கு மேல்)	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
6. 70 வயதுக்கு மேற்பட்டவர்	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
7. நெருங்கிய உறவினர் குடல் புற்றுநோய் இருந்திருந்தால்	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
8. ஒரு வாரத்தில் 5 முறை, மிதமான உடல் செயல்பாடு 30 நிமிடங்களுக்கு குறைவாக செய்வது	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
9. குடல் நோய் இருப்பது	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
10. சர்க்கரை நோய் இருப்பது	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5

பெருங்குடல் மற்றும் மலக்குடல் புற்றுநோயின் அறிகுறிகள்

17. பெருங்குடல் மற்றும் மலக்குடல் புற்றுநோயின் பல எச்சரிக்கை அறிகுறிகள் மற்றும் அறிகுறிகள் உள்ளன. நீங்கள் சிந்திக்கக்கூடிய பலவற்றை தயவுசெய்து பெயரிடுக. (இது ஒரு திறந்த முடிவான கேள்வி, பங்கேற்பாளரின் பதிலின் அடிப்படையில் பதிலைக் குறிக்க வேண்டும்)

அறிகுறிகள்	
<input type="checkbox"/> 1) மலக்குடல் இரத்தப்போக்கு	<input type="checkbox"/> 8) சோர்வு/ இரத்த சோகை
<input type="checkbox"/> 2) வயிற்று வலி	<input type="checkbox"/> 9) எடை இழப்பு
<input type="checkbox"/> 3) குடல் பழக்கங்களில் மாற்றம்	<input type="checkbox"/> 10) மற்றவை
<input type="checkbox"/> 4) குடல் காலியாக இல்லை	<input type="checkbox"/> 11) எதுவுமில்லை
<input type="checkbox"/> 5) மலத்தில் இரத்தம்	<input type="checkbox"/> 99) பதில் சொல்ல விரும்பவில்லை
<input type="checkbox"/> 6) மல வாய் / குத வலி	<input type="checkbox"/> 88) எனக்கு தெரியாது
<input type="checkbox"/> 7) கட்டி	

18. பின்வரும் குறிப்புகளில் பெருங்குடல் மற்றும் மலக்குடல் புற்றுநோய்க்கான அறிகுறிகளாக அல்லது அறிகுறிகள் இல்லாமல் இருக்க கூடும். உங்கள் கருத்துகளை அறிந்து கொள்ள நாங்கள் ஆர்வமாக உள்ளோம்.

	ஆம்	இல்லை	எனக்கு தெரியாது
1. மலக்குடல் இரத்தப்போக்கு பெருங்குடல் மற்றும் மலக்குடல் புற்றுநோய் அறிகுறியாக இருக்கலாம் என்று நீங்கள் நினைக்கிறீர்களா?	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 88
2. வயிற்று அல்லது மல வாய் வலி / குத வலி பெருங்குடல் மற்றும் மலக்குடல் புற்றுநோயின் அறிகுறியாக இருக்கலாம் என்று நீங்கள் நினைக்கிறீர்களா?	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 88
3. குடல் பழக்கங்களில் மாற்றம் (வயிற்றுப்போக்கு, மலச்சிக்கல் அல்லது இரண்டும்) சில வாரங்களுக்கு இருந்தால், பெருங்குடல் மற்றும் மலக்குடல் புற்றுநோயின் அறிகுறியாக இருக்கலாம் என்று நீங்கள் நினைக்கிறீர்களா?	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 88
4. கழிவறையைப் பயன்படுத்தி உங்கள் குடல் முற்றிலும் காலியாக இல்லை என்றால், பெருங்குடல் மற்றும் மலக்குடல் புற்றுநோயின் அறிகுறியாக இருக்கலாம் என்று நீங்கள் கருதுகிறீர்களா?	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 88
5. இரத்த கலந்த மலம் பெருங்குடல் மற்றும் மலக்குடல் புற்றுநோயின் அறிகுறியாக இருக்கக்கூடும் என்று நீங்கள் நினைக்கிறீர்களா?	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 88
6. உங்கள் குத பகுதியில் உள்ள வலி பெருங்குடல் மற்றும் மலக்குடல் புற்றுநோயின் அடையாளம் என்று நீங்கள் நினைக்கிறீர்களா?	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 88
7. வயிற்றுக் கட்டி என்றால் பெருங்குடல் மற்றும் மலக்குடல் புற்றுநோயின் அறிகுறியாக இருக்கலாம் என நினைக்கிறீர்களா?	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 88
8. சோர்வு/ இரத்த சோகை பெருங்குடல் மற்றும் மலக்குடல் புற்றுநோயின் அறிகுறியாக இருக்கலாம் என நினைக்கிறீர்களா?	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 88
9. விளக்க முடியாத உடல் எடை இழப்பு, பெருங்குடல் மற்றும் மலக்குடல் புற்றுநோயின் அறிகுறியாக இருக்கலாம் என நினைக்கிறீர்களா?	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 88

பிரிவு-3 பெருங்குடல் மற்றும் மலக்குடல் புற்றுநோயின் பரிசோதனையின் மனப்பான்மை

	வலுவாக ஒப்புக்கொள்கிறேன்	ஒப்புக்கொள்கிறேன்	உடன்படவில்லை அல்லது கருத்து வேறுபாடு இல்லை	ஒப்புக்கொள்ளவில்லை	வலுவாக ஒப்புக்கொள்ளவில்லை
19. நான் பெருங்குடல் மற்றும் மலக்குடல் புற்றுநோயைப் பெறுவதற்கான ஆபத்தில் இருக்கிறேன் என்று நினைக்கிறேன்	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
20. எதிர்காலத்தில் பெருங்குடல் மற்றும் மலக்குடல் புற்றுநோய் பெறுவது பெறுவது பற்றி கவலைப்படுகிறேன்	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
21. ஆரம்பத்தில் கண்டறியப்பட்டால் பெருங்குடல் மற்றும் மலக்குடல் புற்றுநோய் குணப்படுத்தப்படலாம்	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
22. பெருங்குடல் மற்றும் மலக்குடல் புற்றுநோயின் சிந்தனை என்னை பயமுறுத்துகிறது	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5

23. நான் என் வீட்டில் FOBT* சோதனை செய்ய முடியும் என நம்புகிறேன்	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
24. புற்றுநோய் என்றால் மரண தண்டனை என்று நினைக்கிறேன்	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
25. நான் "colonoscopy"*** செய்ய சங்கடமாக உணர்கிறேன்	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5

*மலத்தில் இரத்தத்தைக் கண்டறிவதற்கான ஒரு சோதனை

***"colonoscopy"- பெருங்குடல் மற்றும் மலக்குடலில் ஏற்படும் எந்தவித அசாதாரணங்களையும் கண்டறிய ஒரு பரீட்சை

பிரிவு-4 பெருங்குடல் மற்றும் மலக்குடல் புற்றுநோயின் பரிசோதனை சார்ந்த பழக்க வழக்கங்கள்

26. கடந்த பன்னிரண்டு மாதங்களில், உங்கள் மருத்துவரை சந்தித்தீர்களா?

- 1) ஆம் _____ (எத்தனை முறை குறிப்பிடுக)
- 2) இல்லை

27. உங்கள் வாழ்நாளில் பெருங்குடல் மற்றும் மலக்குடலில் புற்றுநோய் பரிசோதனையை எப்போதாவது செய்திருக்கிறீர்களா? (≥50 வயது என்றால்)

- 1) ஆம் (கேள்வி 30 க்கு செல்லவும்)
- 2) இல்லை(கேள்வி 29 க்கு செல்லவும்)

28. நீங்கள் எதிர்காலத்தில் பெருங்குடல் மற்றும் மலக்குடலில் புற்றுநோய்க்கான பரிசோதனை செய்ய விருப்பமுடன் இருக்கிறீர்களா? (<50 வயது என்றால்)

- 1) ஆம்(கேள்வி 30 க்கு செல்லவும்)
- 2) இல்லை(கேள்வி 29 க்கு செல்லவும்)

29. பெருங்குடல் மற்றும் மலக்குடலில் புற்றுநோய் பரிசோதனை செய்ய விருப்பமில்லாததற்கோ அல்லது பரிசோதனையில் கலந்து கொள்ளாமல் இருப்பதற்கோ காரணங்கள் (இது ஒரு திறந்த முடிவான கேள்வி, பங்கேற்பாளரின் பதிலின் அடிப்படையில் பதிலைக் குறிக்க வேண்டும்)

- 1) ஆரோக்கியமாக இருக்கிறேன், அதனால் நான் பரிசோதனை செய்ய விரும்பவில்லை
- 2) அதிக செலவாகும்
- 3) பரிசோதனை செய்ய பயம்

- 4) பரிசோதனையின் விளைவுகள் பற்றிய பயம்
- 5) வேலைக்கு செல்வதால்
- 6) வீட்டு வேலை மற்றும் குழந்தைகள் கவனிப்பு
- 7) எனக்கு பரிசோதனை பற்றி தெரியாது
- 8 மற்றவை _____

30. தமிழ்நாட்டில் பரிசோதனை திட்டம் செயல்படுத்தப்பட்டால், பெருங்குடல் மற்றும் மலக்குடலில் புற்றுநோய்க்கான பரிசோதனையை நீங்கள் எவ்வளவு செலுத்த விரும்புகிறீர்கள்? _____

31. எதிர்காலத்தில் பெருங்குடல் மற்றும் மலக்குடலில் புற்றுநோயைப் பற்றி தகவல்கள் எங்கிருந்து பெற நினைக்கிறீர்கள்?

- 1) மருத்துவர்கள் / மருத்துவ பணியாளர்கள்
- 2) நண்பர்கள் / உறவினர்கள்
- 3) தொலைக்காட்சி / வானொலி / செய்தித்தாள்
- 4) மற்றவை _____

தங்கள் பங்கேற்புக்கு நன்றி.

APPENDIX 2 INTERVIEWER SCRIPT (ENGLISH)

Hello, my name is _____. We are conducting a research to assess the knowledge of colorectal cancer among the general population of Tamil Nadu. I would like you to participate in the study and your participation is voluntary. It will take around 10-15 minutes to complete a survey. The information that you provide will be confidential. If you are interested, I will read the consent form and proceed further.

QUESTIONNAIRE SCRIPT

This script will be used for training purpose. It should not be necessary to use this script once the interviewer seems familiar with the questions.

- ✓ Please read the question exactly as it is written.
- ✓ Please be informed that the participants cannot ask for more details or help during the interview and you can discuss after the interview is complete.
- ✓ Do not return to the previous questions once the participant complete that question.
- ✓ The interviewer should mark the answer in the given shadow box.
- ✓ For each question, it is responsible to mark the answer as the participant says and if the participants do not want to answer specific questions, please mark appropriately.
- ✓ Ask your participant to answer the questions in a calm environment or ask the participant to not disrupt while you asking the questions.

Question 15- Open risk factors

To your knowledge, what are the risk factors for developing colorectal cancer?

- ✓ Prompt with 'anything else' until the respondent cannot name any risk factors. Please mark the correct options whatever participant says. If the participant says other than the

listed options (which is undisclosed to the participants), please write in the ‘others’ option. If the person says ‘don’t know’, please move to the next question.

Question 16-Closed risk factors

The following may or may not increase a person’s chance of developing bowel cancer. How much do you agree that each of these can increase a person’s chance of developing bowel cancer?

- ✓ Do not prompt this section. Repeat the format “strongly disagree, disagree, not sure, agree and strongly disagree” and mark the answers.

Clarifications-Please read whenever it is necessary

- ✓ Drinking more than 1 unit of alcohol a day - half a small glass or 175 ml of alcohol
- ✓ Eating less than 5 portions of fruit and vegetables a day - a portion is equivalent to an apple, orange, banana or similar sized fruit, a handful of grapes, one tablespoon of raisins, two serving spoons of cooked vegetables, cereals or pulses.
- ✓ Eating a red meat once a day or more – red meat includes mutton, lamb, beef and veal
- ✓ Having a diet with low fiber – vegetables that has fiber and also helps to push the digested food to the bowel.
- ✓ Having a close relative with a colorectal cancer – It means parents, children, brothers or sisters
- ✓ Doing less than 30 minutes of moderate physical activity 5 times a week - moderate physical activity includes anything that leaves you warm and slightly out of breath such as brisk walking, gardening, dancing or housework.
- ✓ Having diabetes – It is also known as ‘sugar’

Question 17- Open signs and symptoms

There are many warning signs and symptoms of bowel cancer. Please name as many as you can think of:

- ✓ Prompt with ‘anything else’ until the respondent cannot name any risk factors. Please mark the correct options whatever participant says. If the participant says other than the listed options (undisclosed to the participants), please write in the ‘others’. If the person says ‘don’t know’, please move to the next question.

Question 18 – Closed signs and symptoms

The following may or may not be warning signs for bowel cancer. We are interested in your opinion

- ✓ Do not prompt this section. Repeat the format “Yes, No and Don’t know” and mark the answers.

Clarifications-Please read whenever it is necessary

- ✓ Do you think persistent pain in your abdomen (tummy) could be a sign of bowel cancer?
persistent is lasting 3 weeks or longer
- ✓ Do you think a change in bowel habits (diarrhea, constipation or both) over a period of weeks could be a sign of bowel cancer?
Constipation means difficulty in passing the stool
- ✓ Do you think that tiredness/anemia could be a sign of bowel cancer?
Anemia is when the person has low red blood cells

Question 23

I am confident to do the FOBT test in my home

- ✓ FOBT is a test to detect the blood in the stool which might indicate colorectal cancer.
However, not all cancer cases bleed

Question 25

I would feel embarrassed to do a colonoscopy

- ✓ Colonoscopy is an exam to detect any abnormalities in the colon and rectum

இணைப்பு 2. பேட்டியாளர் வழிகாட்டி (Tamil version)

வணக்கம், என் பெயர் _____. தமிழ்நாட்டில் பொது மக்களிடையே பெருங்குடல் மற்றும் மலக்குடல் புற்றுநோயைப் பற்றிய அறிவை மதிப்பீடு செய்வதற்காக ஒரு ஆராய்ச்சி நடத்தி வருகிறோம். நீங்கள் இந்தப் படிப்பில் கலந்துகொள்ள விரும்புகிறேன். உங்கள் பங்களிப்பு தன்னார்வமானது இந்த பேட்டி முடிக்க சுமார் 10-15 நிமிடங்கள் ஆகும். நீங்கள் வழங்கும் தகவல் ரகசியமாக இருக்கும். நீங்கள் ஆர்வமாக இருந்தால், நான் ஒப்புதல் படிவத்தை படிக்கிறேன்.

கேள்வித்தாள் வழிகாட்டி

இந்த வழிகாட்டி பயிற்சி நோக்கத்திற்காக பயன்படுத்தப்படும். பேட்டி கேள்விகள் நன்கு அறிந்த பின்னர் இந்த வழிகாட்டியைப் பயன்படுத்த வேண்டிய அவசியமில்லை.

- ✓ தயவுசெய்து கேள்வி எப்படி இருக்கிறதோ, அதைப் போலவே படிக்கவும்.
- ✓ நேர்காணலின் போது பங்கேற்பாளர்கள் மேலும் விவரங்களை கேட்கவோ அல்லது உதவவோ முடியாது, நேர்காணல் முடிந்தவுடன் நீங்கள் கலந்துரையாடலாம்.
- ✓ பங்கேற்பாளர் ஒரு கேள்வியை நிறைவு செய்தால் முந்தைய கேள்விகளுக்குத் திரும்ப வேண்டாம்.
- ✓ பேட்டியாளர், கொடுக்கப்பட்ட நிழல் பெட்டியில் பதிலைக் குறிக்க வேண்டும்.
- ✓ ஒவ்வொரு கேள்விகளுக்கும், பங்கேற்பாளர் பதிலளிக்கும் போது பதிலைக் குறிப்பிடுவது பேட்டியாளரின் பொறுப்பு மற்றும் பங்கேற்பாளர்கள் குறிப்பிட்ட கேள்விகளுக்கு பதிலளிக்க விரும்பவில்லை என்றால், தயவுசெய்து சரியான முறையில் குறிப்பிடவும்.
- ✓ நீங்கள் கேள்விகளை கேட்கும்போது பங்கேற்பாளர் குறுக்கிட கூடாது மற்றும் அமைதியான சூழலில் கேள்விகளுக்கு பதிலளிக்க உங்கள் பங்காளரிடம் கேளுங்கள்.

கேள்வி 15 - திறந்த ஆபத்து காரணிகள்

உங்களை பொறுத்தவரை பெருங்குடல் புற்றுநோயை உருவாக்கும் ஆபத்து காரணிகள் யாவை?

- ✓ பங்கேற்பாளர் எதுவும் பெயரிட முடியவில்லை என்று கூறும் வரை 'வேறு எதாவது' என்று கேளுங்கள். பங்கேற்பாளர் சொல்லும் சரியான விருப்பங்களைக் குறிக்கவும். பங்கேற்பாளர் பட்டியலிடப்பட்ட விருப்பங்களை தவிர வேறு எதாவது கூறினால், தயவு செய்து 'மற்றவை'

விருப்பத்தில் எழுதவும். பங்கேற்பாளர் 'தெரியாது' என்று சொன்னால், அடுத்த கேள்விக்கு செல்லுங்கள்

கேள்வி 16- ஆபத்து காரணிகள்

கீழ்காணும் குறிப்புகளில் பெருங்குடல் மற்றும் மலக்குடல் புற்றுநோய் ஏற்படுவதற்கான ஒரு நபரின் வாய்ப்பு அதிகரிக்கலாம் அல்லது அதிகரிக்காமலும் இருக்கலாம். அதை பற்றி நீங்கள் எந்த அளவிற்கு ஏற்றுக்கொள்கிறீர்கள் அல்லது ஏற்றுக்கொள்ளவில்லை என்பதை கீழே கொடுக்கப்பட்டுள்ள அறிக்கைகள் மூலம் விவரிக்கவும்.

- ✓ இந்த பிரிவில் பதில்களை தூண்ட வேண்டாம். வடிவமைப்பை மீண்டும் சொல்லி, பதில்களைக் குறிக்கவும்.

விளக்கங்கள்-தேவைப்படும்போது வாசிக்கவும்

- ✓ ஒரு நாளைக்கு 1 அலகிற்கு மேல் மதுபானம் குடிப்பது- அரை சிறிய கண்ணாடி டம்ளர் அல்லது 175 மில்லி மது.
- ✓ நாள் ஒன்றுக்கு 5 க்கும் குறைவான பழம் மற்றும் காய்கறிகள் உள்ள உணவை உட்கொள்வது- ஒரு பகுதி என்பது, ஒரு ஆப்பிள், ஆரஞ்சு, வாழை அல்லது ஒரே அளவிலான பழம், திராட்சை ஒரு கொத்து, ஒரு தேக்கரண்டி உலர் திராட்சை, இரண்டு பரிமாறும் கரண்டிகள் சமைத்த காய்கறிகள், தானியங்கள் அல்லது பருப்பு வகைகள்
- ✓ தினசரி ஒரு தடவை அல்லது அதற்கு மேல் சிவப்பு இறைச்சி உண்ணுவது - ஆட்டிறைச்சி, மாட்டிறைச்சி
- ✓ நார்ச்சத்து குறைவாக உள்ள உணவை உட்கொள்வது- நார்ச்சத்து கொண்ட காய்கறிகள் மற்றும் குடலில் செறிமானம் செய்ய உதவுகிறது.
- ✓ நெருங்கிய உறவினர் குடல் புற்றுநோய் இருந்திருந்தால்- இது பெற்றோர், குழந்தைகள், சகோதரர்கள் அல்லது சகோதரிகள் என்று பொருள்.
- ✓ ஒரு வாரத்தில் 5 முறை, மிதமான உடல் செயல்பாடு 30 நிமிடங்களுக்கு குறைவாக செய்வது- சுறுசுறுப்பான நடைபயிற்சி, தோட்டக்கலை, நடனம் அல்லது வீட்டு வேலை போன்ற மிதமான உடல் செயல்பாடு.
- ✓ சர்க்கரை நோய் இருப்பது

கேள்வி 17 - பெருங்குடல் புற்றுநோயின் அறிகுறிகள்

பெருங்குடல் மற்றும் மலக்குடல் புற்றுநோயின் பல எச்சரிக்கை அறிகுறிகள் மற்றும் அறிகுறிகள் உள்ளன. நீங்கள் சிந்திக்கக்கூடிய பலவற்றை தயவுசெய்து பெயரிடுக.

- ✓ பங்கேற்பாளர் எதுவும் பெயரிட முடியவில்லை என்று கூறும் வரை 'வேறு எதாவது' என்று கேளுங்கள். பங்கேற்பாளர் சொல்லும் சரியான விருப்பங்களைக் குறிக்கவும். பங்கேற்பாளர் பட்டியலிடப்பட்ட விருப்பங்களை தவிர வேறு எதாவது கூறினால், தயவு செய்து 'மற்றவை' விருப்பத்தில் எழுதவும். பங்கேற்பாளர் 'தெரியாது' என்று சொன்னால், அடுத்த கேள்விக்கு செல்லுங்கள்

கேள்வி 18 - பெருங்குடல் புற்றுநோயின் அறிகுறிகள்

பின்வரும் குறிப்புகளில் பெருங்குடல் புற்றுநோய்க்கான அறிகுறிகளாக இருக்க கூடும். உங்கள் கருத்துக்களை அறிய நாங்கள் ஆர்வமாக உள்ளோம்.

- ✓ இந்த பிரிவில் பதில்களை தூண்ட வேண்டாம். வடிவமைப்பை மீண்டும் சொல்லி, பதில்களைக் குறிக்கவும்.

விளக்கங்கள்-தேவைப்படும்போது வாசிக்கவும்

- ✓ வயிற்று அல்லது குடல் வலி பெருங்குடல் புற்றுநோயின் அறிகுறியாக இருக்கலாம் என்று நீங்கள் நினைக்கிறீர்களா?- தொடர்ந்து 3 வாரங்கள் அல்லது அதற்கு மேல் நீடிக்கும்
- ✓ குடல் பழக்கங்களில் மாற்றம் (வயிற்றுப்போக்கு, மலச்சிக்கல் அல்லது இரண்டும்) ஒரு சில வாரங்களுக்கு இருந்தால், பெருங்குடல் புற்றுநோயின் அறிகுறியாக இருக்கலாம் என்று நீங்கள் நினைக்கிறீர்களா- மலச்சிக்கல் என்பது மலத்தை கழிக்க சிரமப்படுவது.
- ✓ சோர்வு/ இரத்த சோகை பெருங்குடல் புற்றுநோயின் அறிகுறியாக இருக்கலாம் என நினைக்கிறீர்களா? இரத்த சோகை என்பது இரத்த சிவப்பணுக்கள் குறைவாக இருக்கும்.

கேள்வி 23

நான் என் வீட்டில் FOBT* சோதனை செய்ய முடியும் என நம்புகிறேன்

- ✓ மலத்தில் இரத்தத்தைக் கண்டறிவதற்கான ஒரு சோதனை

கேள்வி 25

நான் "colonoscopy"*** செய்ய சங்கடமாக உணர்கிறேன்

✓ *Colonoscopy* என்பது பெருங்குடல் மற்றும் மலக்குடலில் ஏற்படும் எந்தவித அசாதாரணங்களையும் கண்டறிய உதவும் ஒரு பரிசோதனை

APPENDIX 3 ORAL CONSENT FORM (ENGLISH)

American University of Armenia

Gerald and Patricia Turpanjian School of Public Health

International Review Board #1

Hello, my name is _____, I am talking on behalf of Kishore Kumar, who is a 2nd year graduate student of Master of Public Health program at the American University of Armenia (AUA) and a final year medical student at Yerevan State Medical University (YSMU), Armenia. We are conducting a research to assess the knowledge of colorectal cancer among the general population of Tamil Nadu. We are planning to interview 307 participants for this study, by randomly selecting them through random digit dialing and if you agree to participate, you will be one of them. Only the research team will have an access to your contact information and we will destroy your phone number two weeks after the data collection process. If you are willing to participate in the study, I will ask you a few questions regarding our research topic. The questionnaire includes questions on socio-demographic factors, as well as questions on knowledge, attitude and practice of colorectal cancer. It will take around 10-15 minutes to complete the survey. Your involvement in this study will be limited to this single interview. Your participation is voluntary and you can finish the interview whenever you feel discomfort. You may skip any question that you do not wish to answer. There is no penalty if you refuse to participate in this study. If you have any questions about the study, please free to ask. There is no direct benefit from the study, however, your answers are valuable and it will be useful for better understanding of current knowledge.

The information that you provide will be confidential. Only research team has an access to the data. Only aggregate results will be reported.

If you have more questions about this study, please feel free to contact our student investigator Kishore Kumar Shankar through the contact number (+91 9566070684, +374 55511032). You can also contact our principal investigator Dr. Vahe khachadourian (vkachadourian@aua.am, +1 8184332203). If you feel you have not treated fairly or have been hurt by joining this study, please contact Varduhi Hayrumyan (vhayrumyan@aua.am, +374 60612617), AUA Human Participants Protection Administrator. If you agree to participate, we will proceed further.

Thank you

இணைப்பு 3. வாய்மொழி ஒப்புதல் படிவம் (Tamil Version)

ஆர்மீனியா அமெரிக்கன் பல்கலைக்கழகம்

ஜெரால்டு மற்றும் பாட்ரிசியா துர்பான்ஜியன் பொது சுகாதாரப்பள்ளி

நிறுவன மறுஆய்வு குழு #1

வணக்கம், என் பெயர் _____, எனது நண்பர் 2 வது ஆண்டு ஆர்மீனியாவின் அமெரிக்க பல்கலைக்கழகத்தின் (AUA) பொது சுகாதார பள்ளியில் முதுகலை பட்டதாரி மாணவர் மற்றும் எரவான் மாநில மருத்துவ பல்கலைக்கழகத்தின் (YSMU) இறுதி ஆண்டு மருத்துவ மாணவர் கிஷோர் குமார் சார்பில் பேசுகிறேன். தமிழ்நாட்டில் பொது மக்களிடையே பெருங்குடல் மற்றும் மலக்குடல் புற்றுநோயைப் பற்றிய அறிவை மதிப்பீடு செய்வதற்காக ஒரு ஆராய்ச்சி நடத்தி வருகிறோம். இந்த ஆய்விற்காக 307 பங்கேற்பாளர்களை பேட்டியெடுக்க திட்டமிட்டுள்ளோம், நீங்கள் சீரற்ற தோராயமான முறையில் தேர்ந்தெடுக்கப்பட்டுள்ளீர்கள், நீங்கள் கலந்து கொள்ள ஒப்புக்கொண்டால், நீங்களும் அவர்களில் ஒருவராக இருப்பீர்கள். ஆராய்ச்சிக் குழுவின் மட்டுமே உங்கள் தொடர்பு தகவலுக்கான அணுகலைக் கொண்டிருப்பார்கள், மற்றும் தரவு சேகரிப்பின் இரண்டு வாரங்களுக்கு பிறகு உங்கள் தொலைபேசி எண்ணை அழித்துவிடுவோம். நீங்கள் இந்த ஆய்வில் கலந்துகொள்ள விரும்பினால், பெருங்குடல் மற்றும் மலக்குடல் புற்றுநோய் பற்றிய கேள்விகளுக்கு பதிலளிக்குமாறு வேண்டுகிறேன். இதில் சமூக பொருளாதார நிலை, பெருங்குடல் மற்றும் மலக்குடல் புற்றுநோய் சார்ந்த அறிவு பரிசோதனையின் மனப்பான்மை மற்றும் பரிசோதனைச் சார்ந்த கேள்விகள் கேட்கப்படும். இந்த பேட்டியை முடிக்க சுமார் 10-15 நிமிடங்கள் ஆகும். இந்த ஆய்வில் உங்கள் ஈடுபாடு ஒரு முறை மட்டுமே இருக்கும். உங்கள் பங்களிப்பு தன்னார்வமானது மற்றும் நீங்கள் அசௌகரியமாக உணரும் எந்தவொரு தருணத்திலும் பேட்டியை முடித்துக்கொள்ளலாம். நீங்கள் பதில் சொல்ல விரும்பாத கேள்விகளை மறுக்கலாம் அல்லது தவிர்க்கலாம். நீங்கள் இந்த ஆய்வில் கலந்துகொள்ள மறுத்தால் எந்த வித அபராதமும் இல்லை. ஆய்வில் ஏதேனும் கேள்விகள் இருந்தால், நீங்கள் கேட்கலாம். ஆய்வில் இருந்து எந்த விதமான நேரடி பயனும் இல்லை, எனினும், உங்கள் பதில்கள் மதிப்புமிக்கவையாகும், மேலும் நடப்பு அறிவைப் புரிந்துகொள்வதற்கு பயனுள்ளதாக இருக்கும். நீங்கள் வழங்கும் தகவல் ரகசியமாக இருக்கும். நீங்கள் அளிக்கும் தகவல்களை, ஆராய்ச்சி குழு மட்டுமே தகவல்களை அணுக முடியும். மொத்த முடிவுகள் மட்டுமே அறிவிக்கப்படும்.

இந்த ஆய்வில் உங்களுக்கு இன்னும் கேள்விகள் இருந்தால், தயவு கூர்ந்து எங்கள் ஆய்வு மாணவர் கிஷோர் குமார் ஷங்கரை தொடர்பு எண் மூலம் தொடர்பு கொள்ளலாம் (+919566070684, +37455511032). மேலும், நீங்கள் எங்கள் முதன்மை ஆராய்ச்சியாளர் வானே கச்சாடோரியான் அவர்களை தொடர்பு கொள்ளலாம் (vkachadourian@aua.am, +1 8184332203). இந்த ஆய்வில் கலந்துகொள்ளும்பொது நீங்கள் நல்லமுறையில் நடத்தப்படவில்லை என்றாலோ அல்லது சங்கடப்படுதப்பட்டாலோ இருந்தாலோ, தயவு செய்து, பொது சுகாதார பள்ளியின் மனித உரிமைகள் பாதுகாப்பு நிர்வாகி வார்டுஹி ஹ்யரும்யான் (vhayrumyan@aua.am, +374 60612617) அவர்களை தொடர்புகொள்ளுங்கள். நீங்கள் பங்கேற்க ஒப்புக்கொள்கிறீர்கள் என்றால், நாம் மேலும் தொடரலாம்.

நன்றி

APPENDIX 4 JOURNAL FORM (ENGLISH)

Name of the interviewer: _____

ID of the interviewer: _____

Respondent ID	Phone number	Date	Results	Refusals Character	Refusal (Gender)	Refusal (District)

Results	Refusal Characteristics	Characteristics code (Gender)
Completed survey (1)	No time (1)	Male-1
Incomplete survey (respondents refused to fully the survey) (2)	Not interested (2)	Female-2
Refusal (3)	Do not want to participate (3)	
Mobile not reachable at that time* (4)	Did not say anything (4)	
No answer* (5)	Other _____ (5)	
Mobile number busy at that time* (6)		
Not eligible (7)		
Call later (postponed interview)* (8)		
Other _____ (9)		

* Three attempts is acceptable for one participant

Respondent ID starts with the interviewer ID and followed by the number of interviews (for example if '1' is interviewer ID and their first interview ID will be '01' and respondent ID will be '101')