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Level and Factors Associated with Knowledge of Colorectal Cancer Risk Factors and Screening among Adults Attending AL-Zaher Primary Health Care Center in Makkah AL-Mokarramah (Cross- Sectional Study),2022.

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Abstract:

Background: *Colorectal cancer is one type of the most common cancers and is classical cancer for screening, with its high incidence and early detection by screening can reduce incidence and mortality rate of the disease.*

Objectives: *To assess the level of knowledge of colorectal cancer risk factors and screening, and associated factors among adults attending primary health care center.*

Methods: *A cross-sectional study was conducted among adults attending AL-Zaher PHCC in Makkah AL-Mokarramah for any reason during the study period.*

Results: *Out of 232 participants,94 (40.5%) were male and 138 (59.5%) were female , with mean age score 33.7± 9.7, where the majority 132 (56.9%) were from group age (26-40) years, 211 (90.9%) were Saudi, 155 (66.8%) were married and 62 (26.7%) were single, 131 (56.4%) had a university degree, and 122 (52.6%) unemployed, 187 (80.6%) were non-smokers, and 161 (69.4%) had no chronic illness. More than half 136 (58.6%) reported the right definition of colon "Large intestine", while less than fifth 41 (17.7%) stated the right function "Water absorption", 187(80.6%) heard about CRC, where the main sources were the social media 117(36.0%) , followed by Family & friends 58 (17.8%) , then TV 51 (15.7%), the main chosen foods were fruits by 136(21.2%), followed by vegetables 134 (20.8%), then bran by 112 (18.7%),whole wheat products by 80(12.4%), and brown bread by66 (10.3%). Two thirds 172 (74.1%) reported that CRC are preventable and 87 (37.5%) heard about early screening, and only 8(3.5%) run early screening, 55 (23.9%) reported the right age of screening "at age of 50". The main answer about methods for detecting were colonoscopy by 174 (44.3%) , followed Fecal occult blood test by 93 (23.9 %), Abdominal C.T scan by 49 (12.5%).The main risk factors were smoking by 159 (68.5%), followed by fatty food by 142 (61.2%), then family history of CRC by 123 (53.0%), and colon polyps in the colon by 99 (42.7%). The main symptoms were an abdominal pain by 186 (80.2%), followed by Loss of appetite and weight loss by 146 (62.9%), then stool with blood by 137 (59.1%), and feeling tired by 126 (54.3%). The mean score of knowledge was 18.9±5.1, indicating low level of knowledge, where 151 (65%) had poor knowledge, and 81 (35%) had good knowledge. There was no significant difference in the knowledge score regarding age, gender, marital status, nationality, educational level, and occupation.*

Conclusion: *This study shades light on the low level of knowledge about CRC, among adults. The results showed a poor knowledge screening area. There was no significant association between age, gender, nationality, marital status, educational level, and occupation and knowledge level. Therefore, health education messages to patients attend the clinics should cover the main points of knowledge gap, especially screening.*

Keywords: *Colorectal cancer, Knowledge, Risk factors, Primary care*

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I. Introduction

Colorectal cancer (CRC) is one of the major worldwide health problems because of its high incidence and associated with high mortality. CRC ranked the third most common malignancy in the world [(1)]. And was the fourth most common leading cause of cancer deaths after lung, stomach, and liver cancer [(2)]. According to the American cancer society, CRC ranks third in the most common cancers among Americans [(3)]. In Saudi Arabia, the incidence of CRC had a constant increase in the period between 2010 and 2013, the number of CRC confirmed new cases increases, for both genders, from 1033 (10.4%) in 2010 to 1387 (11.9%) in 2013(4). In 2013, CRC is one of the most common cancers diagnosed in Saudi Arabia, ranking first among men (13.9%) and third among women after breast and thyroid cancer (10.2%) [(4)].

CRC is tumor that starts in the colon or the rectum. Cancer starts when cells in the body begin to grow out of control. Most colorectal cancers begin as an abnormal growth on the inner lining of the colon or rectum called a polyp. There are several different types of CRC such as adenocarcinomas, carcinoid tumors, gastrointestinal stromal tumors, lymphomas and sarcomas [(5)]. Colorectal cancer may cause one symptom or more such as a chronic change in bowel habits, rectal bleeding, chronic abdominal pain, weakness and fatigue, fever and unexplained weight loss[(6, 7)].

The risk factors that are associated with CRC most of them are modifiable, such as overall nutritional types(low dietary fiber intake, high saturated fat intake) sedentary lifestyles, lack of reasonable level of physical activity, weight gain, excessive smoking and excessive alcohol and infections. Regarding the most important risk factors such as age and family history cannot be modified [(6)]. CRC is one type of the most common cancers and is classical cancer for screening, with its high incidence and early diagnosis by screening can reduce incidence and mortality rate of the disease [(2)]. The United States Preventive Services Task Force (USPSTF) recommends screening for CRC in People with an average risk of CRC should begin screening at age 50 years and continuing until age 75 years by using fecal occult blood testing (FOBT) every year, Flexible sigmoidoscopy every five years, or colonoscopy every ten years in adults. People who have risk factors should start screening for CRC earlier [(8).]

The level of knowledge among the Saudi public regarding colorectal cancer remains uncertain. The community has a significant role in increasing the awareness of the risk factors and warning signs of colorectal cancer. This process will give adequate knowledge about the disease may lead the general population to involve in the cancer screening [(9)].

Despite the increasing in the incidence of colorectal cancer, health promotion roles about CRC is not highlighted by Ministry of Health (MOH) in compare with other cancers such as breast cancer. Unfortunately, there are no national screening programs for the colorectal cancer, therefore, it's important to enhance the role of health promotion and increase the level of awareness toward CRC in the Saudi Population [(6)]. This study aims to assess the level of knowledge of colorectal cancer risk factors and screening among attending primary health care center therefore, awareness about colorectal cancer will increase.

II. Subjects and methods

A cross-sectional study included a non-probability convenience sample of adults attending AL-Zaher PHCC in Makkah AL- Mokarramah, Western Kingdom of Saudi Arabia for any reason during the month of August, 2022 was carried out. Patients with a diagnosis of CRC, those who lack the basic ability to read or write (illiteracy) or who need a guardian were excluded from the study. This study was conducted at Al-Zaher primary health care center.

The sample size of the study was calculated by Raosoft Website for sample size calculation. Based on18% prevalence of acceptable public awareness(2),95% confidence level,5% error and 10% for defaulter and non-respondent of a total population in one month which is around 3000 members.The sample was232 members.

A self-administered questionnaire constructed by the researcher and was validated by three consultants. The questionnaire will consist of two main parts. The First part consists of socio-demographic and personal characteristics including age, gender, marital status, nationality, educational level, occupation, smoking history and chronic health problems while the second part consist of general knowledge about CRC symptoms, risk factors and screening. Regarding knowledge statements, a score of (1) was given to the right answer, a score of (0) was given to the wrong answer and score of (0) was given to the (did not know) answer. There were 34 statements of CRC knowledge divided to five categories: general information (3 factors), screening (6 factors), risk factors (10 factors), symptoms (10 factors), and food (5 factors). Summation of scores computed and the total score was 34. Then the total score was transformed to a percentage, which was categorized into good, who got >60% or >21corrected answer, and poor, who got ≤60% or ≤21corrected answers.

Approval of the regional Research committee was obtained in addition to written permissions from the concerned authorities in MOH-PHCC in Makkah were obtained.

Data were entered using program SPSS version 22 with as significance of p-value < 0.05.

III. Results

Response rate

All the 232 participants' who were present during the study period responded (i.e., 100% response rate).

Socio-demographic characteristics of participants.

Out of 232 participants, 94 (40.5%) were male and 138 (59.5%) were female. The minimum age and maximum age of participants were 18 and 63 years old respectively with mean age score 33.7± 9.7, where the majority 132 (56.9%) were from group age (26-40) years. The majority 211 (90.9%) were Saudi. About two-thirds of participants were married 155 (66.8%), followed by 62 (26.7%) were single and 7 (3.1%) were divorced. More than half 131 (56.4%) had a university degree and 73 (31.5%) had high school level. More than half 122 (52.6%) unemployed. The majority 187 (80.6%) were non-smokers. About 69.4% had no chronic illness. (Table 1)

Participants' responses regarding general information about CRC.

When asked about definition of colon more than half 136 (58.6%) reported the right definition of colon "Large intestine",13 (5.6%) participants reported wrong definition "stomach" while about 16% did not know the definition of colon. Regarding function of colon, most participants did not know the function of colon while less than fifth 38 (16.4%) stated the right function "Water absorption". The majority 187 (80.2%) heard about CRC (Table 2). The main sources of information were social media by 117 (36.0%), followed by family and friends by 58 (17.8%), then TV 51 (15.7%) and journals by 33 (10.2%) (Table 3). Regarding the suitable food rich with fiber, the main chosen foods were fruits by 136 (21.2%), followed by vegetables 134 (20.8%), then bran by 120 (18.7%), whole wheat products by 80 (12.4%), and brown bread by 66 (10.3%)(Table 4). The results regarding knowledge of general information had a significant association between knowledge score of general information category and gender, education, and occupation, where male, higher educator and being employee had significant higher rate of general information than others(p=0.013, p=0.044, and p<0.0001).

Participants' responses regarding CRC screening

About Two thirds 172 (74.1%) reported that CRC is preventable, only the thirds 87 (37.5%) heard about early screening, and only 8(3.4%) run early screening. The main answer about when CRC screening should start was at symptom onset (37.9%), while about the fifth55 (23.9%) reported the right age of screening "at age of 50"(Table 5).The main answer of the methods for screening were colonoscopy by 174 (44.3%), followed by fecal occult blood test by 93 (23.7%), then abdominal computed tomography scan (C.T scan) 49 (12.5%). (Table 6)However, There was a significant association between the knowledge score for screening and gender and

occupation, where male, and being employee had significant higher rate of screening knowledge than others (p=0.008, and p=0.034).

Participants' responses regarding risk factors of CRC.

Regarding the factors that could increase the risk of having CRC, the main factors were smoking by 159 (68.5%), followed by fatty food by 142 (61.2%), then family history of CRC by 123 (53.0%), and colon polyps by 99 (42.7%)(Table 7).The results showed a significant association between knowledge score of risk factors and education, where higher educator had significant higher rate of risk factors knowledge than others (p=0.044).

Participants' Knowledge regarding symptoms of CRC

Regarding the symptoms of CRC, the main answers were abdominal pain by 186 (80.2%), followed by Loss of appetite and weight loss by 146 (62.9%), then stool with blood by 137 (59.1%), and feeling tired by 126 (54.3%). (Table 8)

Participants' Knowledge score.

The mean score of knowledge was 18.9±5.1, indicating low level of knowledge, where 151 (65%) had poor knowledge, and 81 (0.8%) had good knowledge(Table 9). The results in table 9 revealed no significant association between knowledge score category and age, gender, marital status, nationality educational level, and occupation. Despite P value was not significant that age group (26-40 years), female, married, Saudi, higher educators, and employee showed higher knowledge score than others. (Table 10)

Knowledge score regarding domains.

The results showed that the highest score of the domain was for food domain 152 (65.5%), followed by risk factors 50 (21.3%), then 39 (16.5%), and the lowest score for general information domain 22 (9.5%) (p<0.0001, p<0.0001, p<0.0001, p<0.0001) respectively. (Table 11)

IV. Discussion

Cancer is a huge public health problem. Globally, CRC considers as one of the primary tumors affects both men and women, and in Saudi Arabia, it considers as the second cancer. It can be avoided by early discovering and screening. (10) The current study aimed to assess the level of knowledge of colorectal cancer risk factors and screening among attending AL-zaher primary health care center.

This study revealed that the majority of participants do not have an adequate level of knowledge about CRC. This consistent with several studies from Saudi Arabia (10) and Brunei (11). While it is higher than Mansour's study (12) and Omran's study (13). These results revealed that the low levels of knowledge regarding CRC are a common problem and have been reported by several studies. Therefore, primary health care providers should be guided to concentrate more on providing health education on CRC to all patients during their routine appointment.

This study showed that a large number of participants had poor knowledge regarding CRC. The majority (80.6%) heard about CRC but only 58.6% of the target population was able to correctly define the colon. This study showed clear gaps in knowledge about CRC screening (93.5%) (P = 0.0001) while only (37.5%) heard about the screening. This poor score reflects the roles of health promotion about CRC which is not highlighted by Ministry of Health (MOH) in compare with other cancers such as breast cancer and there are no national screening programs for the colorectal cancer. Men had a better knowledge of CRC screening (P = 0.008).This may reflect the nature of our conservative society and men have more chances to receive information and share experience with others. Therefore, a national screening program in Saudi Arabia is recommended to improve CRC knowledge.

Similar to study of Ahmad M. Zubaidi, in Saudi Arabia, showed limited knowledge score regarding CRC screening .however, females, older participants, and more educated participants had statistically significant more knowledge of CRC screening.(1) In Jordan study, only one-tenth of the participants have good knowledge score on the colorectal cancer screening. About (26.0%) heard about CRC, and (22.0%) heard about the screening also it is found that the older participants have higher knowledge levels compared to the younger

participants. (26) In Iran, similar to current study the knowledge of CRC screening is also low, which stimulate the development of CRC screening program. (14) In Malaysia study showed limited knowledge about CRC Screening and about more than (60%) didn't know any screening method (Digital rectal examination, Colonoscopy, Barium enema, or Fecal occult blood). (15)

Regarding risk factors of CRC, the current study showed poor knowledge score about risk factors of CRC (78.7%) (*P* = 0.0001).However, education played a significant role to increase knowledge of CRC risk factors, where higher educator had significant higher score of risk factors knowledge than others (p=0.044). The main risk factors reported by the participants were smoking (68.5%), low fiber food (62.3%), fatty food (61.2%), and family history of CRC (53.0%). The study of Ahmad M. Zubaidi, in Saudi Arabia, showed adequate knowledge score to risk factors of CRC. The main risk factors reported by the participants were inflammatory bowel syndrome and polyps. People with high education and older age group had a significant higher score of risk factors knowledge than others. (1)

Mansour-Ghanaei study showed the Awareness of risk factors for CRC was adequate in the Iranian population and reported the main risk factors were family history (83.8%), low fibber food (69.9%), and fatty food (65.1%).However, the older age group and were higher educator were significantly more knowledgeable about CRC risk factors. (12) In Brunei study, the overall knowledge of CRC risk factors was very poor. The main risk factors were fatty food (13.9%), smoking (11.8%), and low fibber food (9.9%). However, education and family history of CRC played a significant role in increased knowledge of CRC risk factors. (11)

The current study showed poor knowledge score about symptoms of CRC (83.5%) (*P* = 0.0001).The majority reported abdominal pain (80.0%) as the main symptoms, followed by loss of appetite and weight loss (62.9%), blood with stool (59.1%). Similar to Ahmad M. Zubaidi study, the knowledge level of CRC symptoms was poor. The main symptoms were change in bowel habits (59.9%) and abdominal pain (52.3%). (1) Mansour-Ghanaei also found out that, the most common symptoms were weight loss (66.7%), rectal bleeding (63.2%), and abdominal pain (62.7%). (12) In Brunei study, the main answered symptoms were abdominal pain (32.6%), blood with stool (22.7%), and Diarrhea and constipation (19.4%) this is in agreement with this study. (11) These differences in the percentage could be due to several factors such as socio-economic factors, geographic areas, sample size, and studies nature.

Unlike to many previous studies, regarding the comparison of knowledge levels and demographic data, there was no significant association between age, gender, nationality, marital status, educational level, and occupation and knowledge level. Despite P value is not significant this study showed that group age (26-40), female, married then single, Saudi, higher educator employee were more knowledgeable than others. In Zubaidi s` study, females, older participants, and higher education had a significant higher level of knowledge. (1) In Iran study, found a significant higher rate of knowledge level and employee, and higher educators (12). Bas et al, reported a significant difference in knowledge level regarding age and marital status (p=0.008, p=0.001). (16).

V. Conclusion

This study shades light on the low level of knowledge about CRC, among adults. There was no significant association between age, gender, nationality, marital status, educational level, and occupation and knowledge level. The results showed a poor knowledge screening area.

Recommendations

Based on the findings of the researcher study, the following can be recommended:

- Health education messages to patients attend the clinics should cover the main points of knowledge gap, especially screening.
- The administrators in MOH should try to organize and conduct health education programs on CRC in simple and familiar language among community through mass media to increase public awareness and knowledge regarding CRC.

- Encourage the patients to talk about CRC with their doctors.
- Further nation-wide studies on assessment of adults' knowledge regarding CRC need to be conducted in larger sample size, different age group, and regions other than Makkah Al-Mukarramah, so as to identify the level and distribution of different knowledge grades as well as the areas and topics of knowledge deficits.
- To present the most key points in this study to PHCC doctors in training centers and to write a pamphlet about CRC to be distributed to patients.

VI. References

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Table (1) Socio-demographic characteristics of participants

Data presented as number, (%), or as Mean±SD

Variable	Mean± SD	Rang (min-max)
Age	33.7±9.7	(18-63)
Variable	**N**	**%**
Age category		
18-25	46	19.8
26-40	132	56.9
41-60	52	22.4
>60	2	0.8
Gender		
Male	94	40.5
Female	138	59.5
Nationality		
Saudi	211	90.9
Non-Saudi	21	9.1
Marital status		
Married	155	66.8
Single	67	28.9
Divorced	7	3.1
Widow	3	1.3

Data presented as number, (%), or as Mean±SD.

Table (2) Participants' responses regarding general information about CRC.

Variable	N	%
Colon definition		
Large intestine	136	58.6
Stomach	13	5.6
Don't know	36	15.5
Small intestine	31	13.4
Stomach and Small intestine	16	6.9
Colon function		
Food digestion	57	24.6
Water absorption	41	17.7
Don't know	70	30.2
Storage of waste	56	24.1
No function	8	3.4
Hearing about CRC		
Yes	187	80.6
No	45	19.4

Table (3) source of information.

Source of information# (n=325)		
Variable	**N**	**%**
Journals	33	10.2
TV	51	15.7
Educational curriculum	22	6.8
Family & friends	58	17.8
Social media	117	36.0
Hospital	27	8.3
Primary health care center	17	5.2

Data presented as number and (%).

Multiple responses.

Table (4) Participants' responses regarding of Food rich with fiber.

Food rich with fiber# (n=643)		
Variable	**N**	**%**
Fruits	136	21.2
White rice	34	5.3
Bran	120	18.7
Pasta	15	2.3
White bread	15	2.3
Vegetables	134	20.8
Milk products	14	2.2
Whole wheat products	80	12.4
Meat, fish, chicken	29	4.5
Brown bread	66	10.3

Multiple responses

Data presented as number and (%).

Table (5): Participants' responses regarding CRC screening

Hearing about screening		
Variable	**N**	**%**
Yes	87	37.5
No	145	62.5
Running screening		
Yes	8	3.5
No	224	96.5
Screening age		
Age 30	57	24.6
Age 40	31	13.5
Age 50	55	23.9
When there are symptoms	88	37.9

Data presented as number and (%).

Table (6): Participants' responses regardingMethods of CRC screening

Methods of CRC screening. (n=393)		
Variable	**N**	**%**
Colonoscopy	174	44.3
Sigmoidoscopy of left part of colon	42	10.7
Fecal occult blood test	93	23.7
Abdominal C.T scan	49	12.5
Abdominal X-ray	35	8.9

Data presented as number and (%).

Multiple responses.

Table (7): Correct answers ofCRC risk factors

Variable	N	%
Smoking increase the risk of having CRC	159	68.5
Family history of CRC increase the risk of having CRC	123	53
Aging increase the risk of having CRC	94	40.5
H. Pylori will not increase the risk of having CRC	57	24.6
Irritable bowel syndrome will not increase the risk of CRC	63	27.2
Diabetes mellitus increase the risk of having CRC	56	24.1
Obesity and will not increase the risk of having CRC	51	22.0
colon polyps in the colon increase the risk of having CRC	99	42.7
Food rich with fiber will not increase the risk of CRC	145	62.5
Fatty food increases the risk of having CRC	142	61.2

Data presented as number and (%)

Table (8) Correct answers regarding symptoms of CRC

Variable	N	%
CRC can start without symptoms	93	40.1
Abdominal pain could be a symptom of CRC	186	80.2
Chang bowel motion between constipation or diarrhea is not symptoms of CRC	36	15.5
Feeling of flatulence is not symptoms of CRC	55	23.7
Stool with blood could be a symptom of CRC	137	59.1
The color of the stool changes to dark black could be a symptom of CRC	98	42.2

Yellowish skin color is not symptoms of CRC	45	19.4
Feeling tired could be a symptom of CRC	126	54.3
Iron deficiency could be a symptom of CRC	69	29.7
Loss of appetite and weight loss could be a symptom of CRC	146	62.9

Data presented as number and (%).

Table (9): Knowledge score

Variable	Mean± SD	Rang (min-max)
Knowledge score	18.9±5.1	(5-31)
Variable	**N**	**%**
Poor (≤60)	151	65.0
Good (>60)	81	35.0

Data presented as number, (%), or as Mean±SD

Table (10): The relation between knowledge score category and demographic data.

Variable		Poor (≤60%)	Good (>60%)	X^2	P value
Age	18-25	30 (12.9%)	16 (6.9%)	2.14	0.562
	26-40	79 (34.1%)	49 (22.9%)		
	41-60	35 (15.1%)	17 (7.3%)		
	>61	2 (0.86%)	0 (0.0%)		
Gender	Male	58 (25.0%)	36 (15.5%)	0.072	0.449
	Female	90 (38.8%)	48 (20.5%)		
Nationality	Saudi	137 (59.0%)	74 (31.9%)	1.76	0.139
	Non-Saudi	11 (4.7%)	10 (4.3%)		
Marital status	Married	100(43.10%)	55 (23.7%)	1.86	0.737
	Single	39 (16.8%)	28 (12.1%)		
	Divorced	4 (1.7%)	3 (1.2%)		
	Widow	2 (0.9%)	1 (0.4%)		
Educational level	Elementary	5 (2.2%)	3 (1.3%)	3.79	0.143
	Intermediate	13 (5.6%)	7 (3.0%)		
	High school	47 (20.3%)	26(11.2%)		
	University	78 (33.6%)	53 (22.9%)		
Occupation	Employee	65 (28.0%)	45 (19.4%)	1.53	0.136
	Non-employed	83 (35.8%)	39 (16.8%)		

Data presented as numbers and percentages.

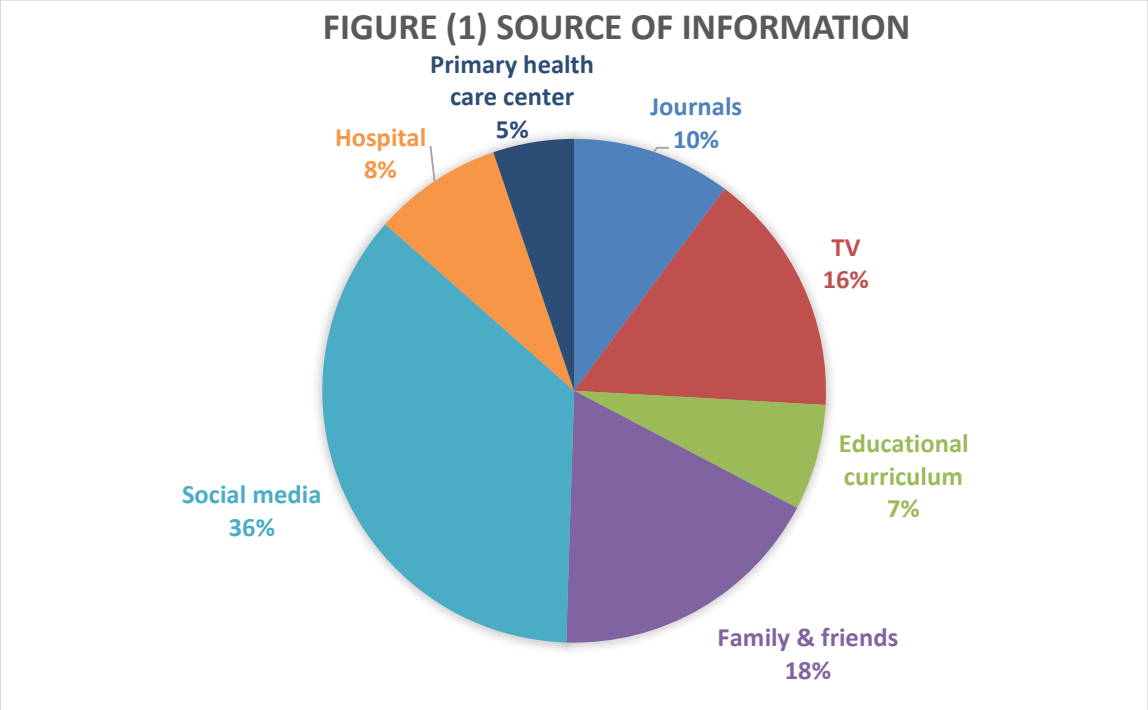
Comparisons were made using Chi-square test.

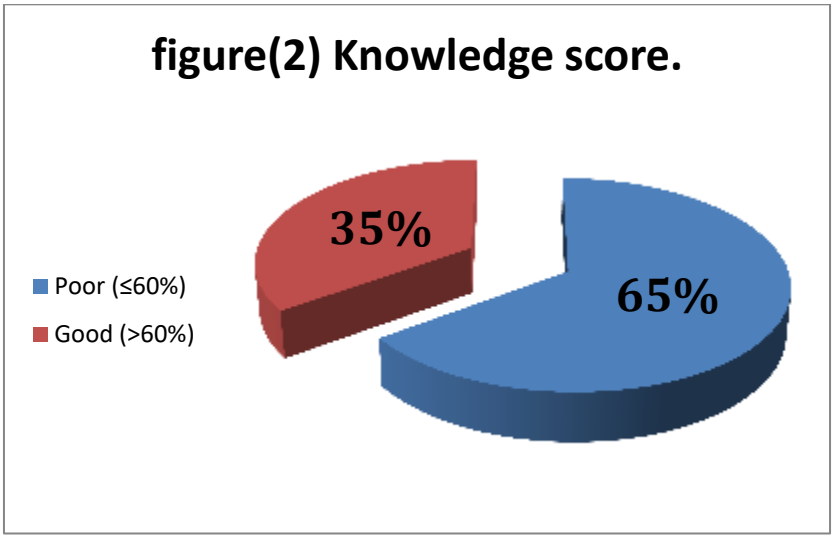
Table (11): Knowledge score regarding domains.

Variable	Knowledge score		Knowledge category		P value
	Mean	SD	Poor	Good	
General information	1.5	0.8	118 (50.9%)	114 (49.1%)	0.793
Screening	1.0	0.6	217 (93.5%)	15 (6.5%)	0.0001**

Risk factors	4.6	2.2	182 (78.7%)	50 (21.3%)	0.0001**
Symptoms	4.3	2.2	193 (83.5%)	39 (16.5%)	0.0001**
Fiber foods	7.0	1.7	80 (34.5%)	152 (65.5%)	0.0001**

Data presented as numbers and percentages or as Mean± SD
Comparisons were made using Chi-square test.
* Statistically significance at the <0.05 level.





The relation between knowledge score category and demographic data: