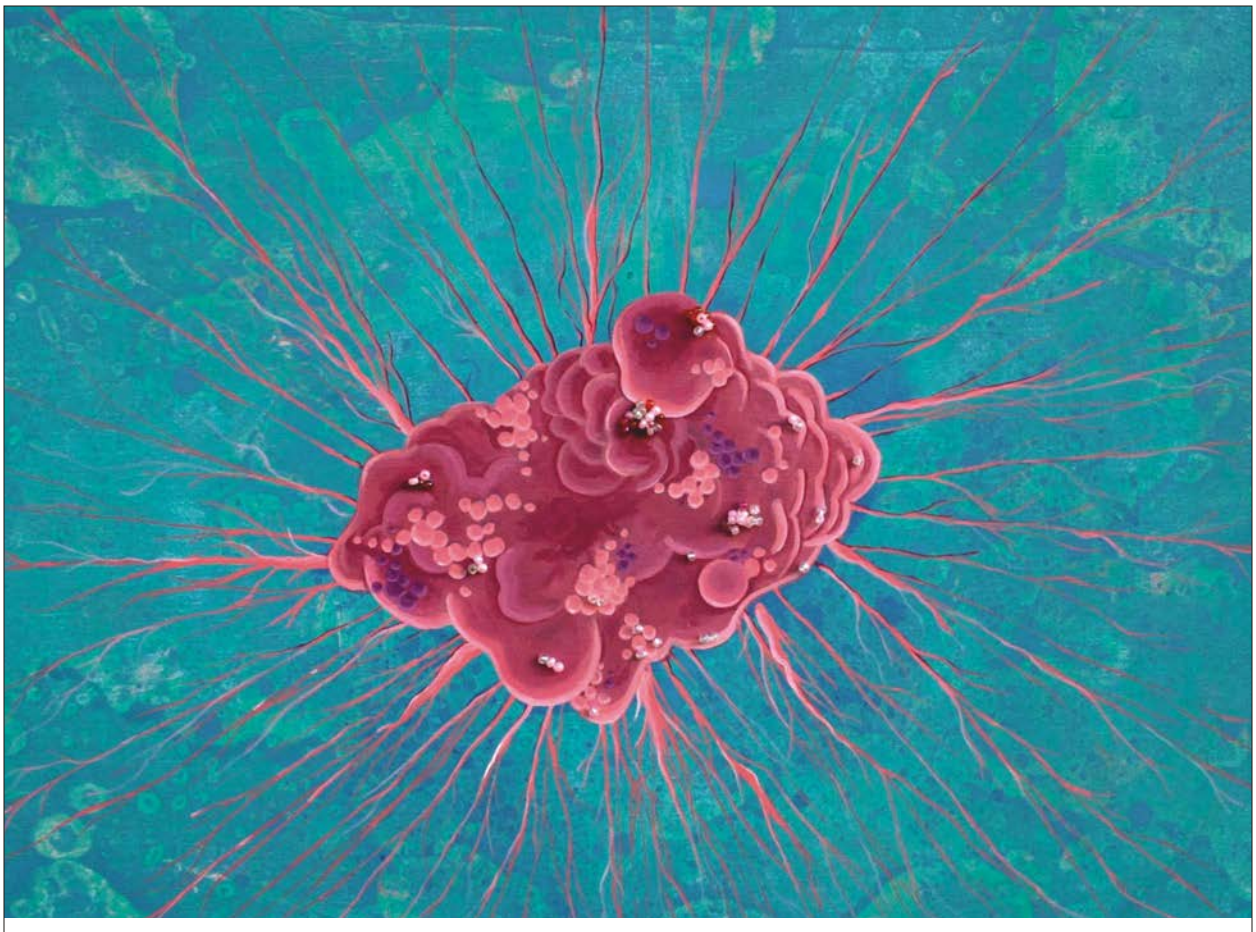

International Journal of Cancer Research

ISSN 1811-9727

Academic Journals Inc.

www.academicjournals.com

OPEN ACCESS International Journal of Cancer Research

ISSN 1811-9727
DOI: 10.3923/ijcr.2018.70.76

Research Article
Knowledge of Colorectal Cancer Screening Guidelines and Perceptions of Barriers among Nursing and Medical Students in a Jordanian University

[1]Maysoon Hani Rababah, [2]Mosa Ali Alhassan and [3]Mohammad Abdelmotaleb Al-Motlaq

[1]Hashemite University, Zarqa, Jordan
[2]Jordan University of Science and Technology, Irbid, Jordan
[3]Hashemite University, Zarqa, Jordan

Abstract

Background and Objective: Colorectal cancer is the second most common cancer among Jordanian men and women. The rate of CRC screening utilization is low related mainly to inadequate knowledge. The aim of the study was to evaluate medical and nursing student's knowledge of CRC screening, examining the relationship between their level of knowledge and their sociodemographic characteristics and assess their perception of barriers to CRC screening. **Materials and Methods:** Cross sectional design was used with a convenience sample of 450 medical and nursing students studying at one Jordanian university. The study involved participant's completion of a self-administered questionnaire including socio-demographics, CRC screening knowledge and perception of CRC screening barriers. **Result:** The majority of students (65.1%) had poor knowledge of CRC screening guidelines. Knowledge scores significantly increased as age and academic level of students increased. Top patient related barriers were fear of outcomes, lack of awareness and anxiety while system related barriers included cost of examination and dates of appointment. **Conclusion:** The results of this study concluded, stress is the need for enhancing curriculum and educational support by revisiting components.

Key words: Knowledge, colorectal cancer, screening, guidelines, barriers, nursing, medicine

Citation: Maysoon Hani Rababah, Mosa Ali Alhassanc and Mohammad Abdelmotaleb Al-Motlaq, 2018. Knowledge of colorectal cancer screening guidelines and perceptions of barriers among nursing and medical students in a Jordanian university. Int. J. Cancer Res., 14: 70-76.

Corresponding Author: Mohammad Abdelmotaleb Al-Motlaq, Hashemite University, Zarqa, Jordan Tel: 0096253903333/5377

Competing Interest: The authors have declared that no competing interest exists.

Data Availability: All relevant data are within the paper and its supporting information files.

INTRODUCTION

Colorectal Cancer (CRC) is a major health problem and one of the most commonly diagnosed cancers that is rapidly increasing in both men and women[1]. The American Cancer Society estimated that over 134,000 new cases would be discovered with CRC with more than 49,000 deaths are expected[2]. In Jordan, CRC is the second most common cancer among men and women and a major cause of death[3]. Crude incidence rate of both genders was 8.9/100,000 population with a median age of 61 years at diagnosis. Incident rate of CRC was 11.3% constituting the most prevalent type among males (12%) and the second most prevalent among females (10.7%)[3].

Screening for CRC can increase survival rates for patients, decrease morbidity and costs[4,5]. Colorectal Cancer can be prevented by detecting adenomatous polyps, which are considered the most common risk for CRC[6-8]. CRC screening involves a scope of guidelines that identify individuals who are more likely to have CRC or adenoma[9]. Many bodies provided some guidelines for CRC screening including the American Cancer Society (ACS) where an annual routine colorectal cancer screening for people over 50 years of age until 75 years of age was recommended[2]. Classification of people as average risk people and high-risk people according to their readiness and risk factors were also provided. Screening modalities for CRC includes annual stool testing (Fecal for Occult Blood Test and Fecal Immunochemical), flexible Sigmoidoscopy every 5 years and Colonoscopy every 10 years[2,10]. Despite the importance of screening, the incident rate of people who was screened was low[11-13]. Between 2002 and 2011 in the USA, the incident rate of CRC screening has significantly decreased by 3.6 and 3.2% per year among men and women, respectively[14]. In 2008, only 54% of American adults over 50 years were screened for CRC, while in the same year 75% of women were screened for breast cancer and 72% for cervical cancer[14].

For successful CRC screening patients need to be aware of the availability of the screening tests, its benefits, options and risk factors[15,16] while barriers should be conquered. A lack of knowledge and some personal beliefs toward screening could hinder individual's acceptance of screening[17,18]. Similarly, health care providers' level of awareness about CRC screening guidelines is a significant factor in influencing patient's attitudes towards screening[19,20]. Therefore, assessing medical and nursing student's knowledge on CRC screening is important to understand their perceptions and attitudes as future representatives of the health sector[21,22]. The current study assessed medical and nursing student's knowledge about CRC screening and their perception of barriers to CRC screening.

MATERIALS AND METHODS

To examine the perception of a sample of students from both medical and nursing schools, a descriptive exploratory study with a cross-sectional design was used. The study was approved by Jordan University of Science and Technology's Institutional Review Board (No. 36\94\2016). The study involved participants completion of a self-administered questionnaire of three sections (1) Sociodemographic sheet (2) CRC screening knowledge instrument and (3) Student's perception of CRC screening barriers scale. The used questionnaire was originally developed by Omran *et al.*[23] to evaluate the knowledge, barriers and experiences of CRC among health care providers in Jordan. The original questionnaire which was reviewed by 10 experts for accuracy, face and content validity had a reliability of 0.79[23]. Participants were asked to complete the questionnaire at their classroom or clinical setting which required less than 10 min. Inclusion criteria included medical and nursing students who could read and write English language. Excluded from the study were 1st, 2nd and 3rd year medical students and 1st year nursing students because they havn't started their clinical training yet. Bridging students who work/worked at any health institution and students who were previously diagnosed with CRC and/or exposed to one of CRC screening tests were also excluded. First, a total of 2200 students constituted the population of the study, of which 500 were recruited and invited to participate. Fifty students were excluded according to the criteria among which 32 didn't complete the questionnaire.

Data analysis was conducted using the Statistical Package for Social Sciences software (SPSS) version 22. Descriptive statistics were used to describe study sample and variables; (frequencies, ranges, means, medians and standard deviations). Pearson correlation, Spearman's correlation and chi square were employed as appropriate to examine relationships between student's characteristics and knowledge level.

RESULTS

Four hundred and fifty students studying medicine (n = 327, 72.7%) and nursing (n = 123, 27.3%) at one Jordanian University were recruited to this study with a response rate of 90%. Socio-demographic and professional characteristics of the sample were shown in Table 1. More than half of participant were females (51.3%, n = 231). The mean age of participants was 22.5 (SD = 1.6) years with a range of 19-30 years. Most participants (97.8%) were single. Medical students included 28.9% (n = 130) from the fourth year, 23.8% (n = 107) were at their 5th year and 20% (n = 90)

Table 1: Sociodemographic and professional characteristic of the study participants (N = 450)

Variables	Frequency (%)	N	M (SD)
Age			22.51 (1.64)
Gender			
Male	48.7	219	
Female	51.3	231	
Marital status			
Single	97.8	440	
Married	2.2	10	
Study specialty			
Medical	72.7	327	
Fourth year	28.9	130	
Fifth year	23.8	107	
Sixth year	20.0	90	
Nursing	27.3	123	
Second year	11.1	50	
Third year	8.0	36	
Fourth year	8.2	37	
Family history of cancer			
Positive history	20.9	94	
Negative history	79.1	356	
Monthly income			200-10000
Low income	50.0	225	
High income	50.0	225	

Table 2: Knowledge level classification and results (N = 450)

Knowledge level	*Range of score	M (SD)	% (n)
Poor knowledge	0-3.75	2.29 (1.00)	65.1 (293)
Good knowledge	4-6.00	4.81 (0.64)	31.3 (141)
Very good knowledge	6.25-8	7.27 (0.51)	3.6 (16)

*Categorized by the original developer

were at the 6th year. Nursing students included 11.1% (n = 50) from the 2nd year, 8% (n = 36) students from the 3rd year and 8.2% (n = 37) from the 4th year. The monthly family income ranged from 200-10000 JD (M = 1272.46, SD = 1355.62). Because the monthly family income was highly skewed (3.85), the income variable was dichotomized. Based on median of 975 JD, 50% of students had low income (<975) JD. Students who had positive family history of CRC found to be 20.9% (n = 94). The current study showed that mean knowledge score of the total sample was 3.24 (SD = 1.67). The results indicate that the majority of students had poor knowledge (Table 2).

Knowledge level of colorectal cancer screening: Overall, medical and nursing students were unaware about CRC screening guidelines (its methods, eligibility of screening age and appropriate interval of each method) manifested by their low knowledge scores. Table 3 shows a dissection of the test used to assess students CRC knowledge. The results show diverse scores with only one item was answered correctly by over 50% of participants (Item 3: Abdominal ultrasound is not a recommended screening method for CRC). The majority were unaware about other facts regarding CRC screening such as the recommended age to begin CRC screening, age when CRC screening is contraindicated and recommended frequency for each CRC screening method. While 36.7% correctly knew that Fecal for Occult Blood should be done yearly, only 16.4% were aware that Flexible sigmoidoscopy is recommended every 5 years and 10.4% knew that colonoscopy is recommended every 10 years.

Regarding their sources of CRC knowledge, 55% of students reported that curriculum and university courses were the main sources, while 21.3% (n = 96) acquired their knowledge during their clinical training. Multimedia was ranked third accounting for 13.6% while only 5.9% of students learned from the literature and research and 3.9% of students acquired their knowledge from an international recommendation.

Students were also asked an open ended question to list 4 main risk factors for CRC. The majority of students from both specialties (72%) knew that CRC was associated with a positive family history. Irritable bowel disease was ranked second by 48% (n = 216). In addition, 40% of participants (n = 180) correctly reported that aging is also a risk factor. Finally, 37% (166) of participants reported that smoking was also a risk. In addition, students were asked to list the main clinical manifestations for colorectal cancer. Most students (64%) reported that bloody stool is a main sign. Constipation reported by 189 of participants (42%) while 33.7% (n = 152) pointed to abdominal pain and discomfort as a clinical manifestation associated with CRC.

Medical students scored significantly higher on the knowledge questionnaire (p = 0.00). However and regardless of their specialty, a significant positive relationship was found between students' knowledge of CRC screening and their age (r = 0.23, p = 0.00) academic level (rho = 0.36, p = 0.00) and family income (p = 0.00). No significant differences found between students' knowledge based on their gender (p = 0.83), having a positive family history of cancer (p = 0.52) (Table 4).

Perceptions of students regarding barriers of CRC screening: Two domains were measured; patient related barriers and system related barriers (Table 5). The main patient-related barrier perceived by students was fear of outcome (67.1%) while culture and religion was perceived a least barrier (22.7%). On the other hand, the main system-related barrier perceived by students was the cost of examination (46.7%), while the least perceived barrier was beliefs of health care providers that CRC is not a common health problem (22.9%).

Table 3: Percentage of correct answers to knowledge of CRC screening

Items	Correct (%)
Age to begin CRC screening (age 50 years)	41.6
Adults who not recommended for CRC screening (older than 75 years)	17.0
Procedure not recommended for CRC screening (abdominal ultrasound)	55.0
Recommended screening frequency using FOB (every 1 year)	36.7
Recommended screening frequency-using sigmoidoscopy (every 5 years)	16.4
Recommended screening frequency using of colonoscopy (every 10 years	10.4

Table 4: Factors influencing knowledge level

	Knowledge			Relations		
Variables	Weak (%)	Good (%)	Very good (%)	X^2	Df	p-value
Gender						
Male	64.40	32.40	3.20	0.35	2	0.83
Female	65.80	30.30	3.90			
Study specialty						
Medical	54.74	40.67	4.59	56.65	2	0.00*
Nursing	92.69	6.50	0.81			
Family history						
Positive	60.63	36.17	3.19	1.297	2	0.52
Negative	66.29	30.05	3.65			
Monthly income						
Low income	73.34	24.44	2.22	13.74	2	0.00*
High income	56.89	38.22	4.89			

*Statistically significant relationship ($p<0.05$)

Table 5: Frequency of perceived barriers by medical and nursing students (n = 450)

	Perception of students			
	Major barrier		Not a barrier	
Barriers	Percentage	N	Percentage	N
Patients related barrier				
Fear of outcome of diagnosis	67.15	302	5.8	26
Lack of awareness	62.00	279	10.7	48
Anxiety and embarrassment	53.35	240	8.2	37
Beliefs of discomfort from screening tests	46.90	211	9.6	43
Perception that CRC is not a life threatening	27.60	124	32.2	145
Beliefs that CRC screening is not effective	23.35	105	30.7	138
Culture and religion barriers	22.70	102	40.9	184
System related barriers				
Very expensive screening cost	46.70	210	11.8	53
Too late appointment for screening	43.10	194	11.3	51
Lack of policy and protocols for screening at hospital	40.90	184	13.3	60
Screening are not actively recommended by the medical team	38.20	172	23.6	106
Shortage of trained professions to conduct follow-up invasive screening (e.g. Colonoscopy)	34.70	156	20.9	94
Very big patient load	32.70	147	22.7	102
Shortage of trained health care providers	30.40	137	22.0	99
Un available services of screening	29.30	132	22.9	103
Beliefs of health care providers that CRC is not common health problems	22.90	103	36.4	164

DISCUSSION

The current research has provided some insight into the level of Knowledge of colorectal cancer screening among medical and nursing students. As the future representatives of the health sector, a lack of knowledge among these populations and their personal beliefs toward screening is considered a significant factor in influencing individual's acceptance and rejection of screening. This study was distinctive from previously conducted studies as it investigated CRC screening among students. Generally, Jordanian Students' knowledge of who should receive CRC screening and frequency for screening were very poor. Majority of students (58.4%) were unaware that 50 years is the recommended age to begin CRC screening. These results were consistent with other international studies that showed poor knowledge of cancer screening guidelines[24-27]. Few medical and nursing students in the current study were aware about

the frequency for each screening method. These results were incongruent with findings from the USA that showed two thirds of medical students had high scores of knowledge about frequency of CRC screening[25]. It was also incongruent with findings from another study conducted in 2011 which reported that most medical students were aware that colonoscopy and FOB were recommended tests, while fewer knew that Flexible Sigmoidoscopy being a CRC screening option[19]. This variation could be related to the lack of formal adoption of the international recommendations for CRC screening guidelines in Jordanian health care settings and not included in medical or nursing curricula.

As expected, knowledge was higher among medical students which can be explained by their superlative experience with screening knowledge during their training. In addition, there was a statistically significant difference across academic years where knowledge level increased as students progressed in their studies. This was congruent with findings of previous literature which revealed a positive impact of clinical training for students among cancer screening guidelines over there academic years[19,25]. Regarding risk factors for CR, majority of students were aware about them. Students considered positive family history as the most significant factor. These matched findings of a previous study[19] where family history was considered the most risk factor for cancer. Although not scientifically confirmed, half of students reported that an irritable bowel disease is positively associated with CRC as a risk factor.

Similar to a qualitative study conducted to examine nursing and medical students' cancer education and training in Latino[28], the current study showed that nursing students received their knowledge about cancer screening during their clinical training, while medical students acquired their knowledge from university curricula. This supports the importance of involving cancer screening guidelines, education and prevention into their curricula and clinical training, particularly CRC screening. This totally supports the efforts for medical and nursing education that integrates evidence-based practice knowledge across classroom and clinical placements.

A major variable investigated here was barriers to screening. The main barriers perceived by students were fear of outcomes and lack of awareness regarding CRC screening. These were similar to findings from other studies conducted with students, heath care providers and patients[19,23,29,30]. The results stress the need for enhancing students' knowledge on different tests' benefits and side effects that may decrease the fears of screening outcomes and increase the awareness among Jordanians. The study also investigated system related barriers where cost was perceived by students as the main barrier. Many studies revealed the financial constraints were considered major system related barriers[29-32]. In Jordan, these results were attributed to a lack of effective health insurance coverage for cancer screening. However, a recent Jordanian study among health care providers showed that shortage of trained healthcare providers and lack of policies were the main system related barriers[23]. The difference could be attributed to students' lack of awareness about hospital and health system policies and protocols.

While the response rate was 90%, the involvement of one institution as the setting for the study and the convenient sampling technique used might be considered limitations to the generalizability of the results. However, health education programs and campaigns should be designed at community level involving both medical and nursing students to provide the community with necessary information about CRC screening methods, options, benefits and side effects. This requires some attention to student's ability to conduct these programs. As such, medical and nursing educational consultants should review the curricula and clinical training courses in order to provide baseline data about CRC screening guidelines. Future research could use longitudinal designs for in depth understanding of this issue and an interventional study is the best way to investigate the effect of educational programs and students' knowledge about CRC screening guidelines.

CONCLUSION

An important approach to tackling the increased prevalence of cancer in Jordan is by raising awareness. As future representatives of the health sector, medical and nursing students are an essential part of the efforts towards better management. The current study showed a lack of knowledge among Jordanian medical and nursing students and stressed a need for some action. This can be considered in any future plans for modification to any curricula of both disciplines.

SIGNIFICANCE STATEMENT

The results of this study generally showed poor knowledge of colorectal cancer screening among medical and nursing students in Jordan. These were incongruent with previous international research and attributed to lack of formal adoption of the international recommendations for CRC screening guidelines in Jordanian health care settings. This was also attributed in part to excluding these guidelines

in medical or nursing curricula. Therefore, the study pushes for health promotion programs involving both medical and nursing students. However, a review to their curricula and clinical training courses is needed to equip them with the necessary knowledge and skills.

REFERENCES

1. Jemal, A., F. Bray, M.M. Center, J. Ferlay, E. Ward and D. Forman, 2011. Global cancer statistics. CA: Cancer J. Clin., 61: 69-90.
2. Smith, R.A., D. Manassaram-Baptiste, D. Brooks, M. Doroshenk and S. Fedewa *et al*., 2015. Cancer screening in the United States, 2015: A review of current American cancer society guidelines and current issues in cancer screening. CA Cancer J. Clin., 65: 30-54.
3. NCR., 2012. Cancer incidence in Jordan report of 2012. Non-Communicable Disease Control Section, Amman, Jordan.
4. Hardcastle, J.D., N.C. Armitage, J. Chamberlain, S.S. Amar, P.D. James and T.W. Balfour, 1986. Fecal occult blood screening for colorectal cancer in the general population results of a controlled trial. Cancer, 58: 397-403.
5. Scholefield, J.H., S. Moss, F. Sufi, C.M. Mangham and J.D. Hardcastle, 2002. Effect of faecal occult blood screening on mortality from colorectal cancer: Results from a randomised controlled trial. Gut, 50: 840-844.
6. Bond, J.H., 2003. Colon polyps and cancer. Endoscopy, 35: 27-35.
7. Feeley, T.H., J. Cooper, T. Foels and M.C. Mahoney, 2009. Efficacy expectations for colorectal cancer screening in primary care: Identifying barriers and facilitators for patients and clinicians. Health Commun., 24: 304-315.
8. Levin, B., D.A. Lieberman, B. McFarland, K.S. Andrews and D. Brooks *et al*., 2008. Screening and surveillance for the early detection of colorectal cancer and adenomatous polyps, 2008: A joint guideline from the American Cancer Society, the US Multi-Society Task Force on Colorectal Cancer and the American College of Radiology. Gastroenterology, 134: 1570-1595.
9. Winawer, S.J., R.H. Fletcher, L. Miller, F. Godlee and C. Mulrow *et al*., 1997. Colorectal cancer screening: Clinical guidelines and rationale. Gastroenterology, 112: 594-642.
10. Bibbins-Domingo, K., D.C. Grossman, S.J. Curry, K.W. Davidson and J.W. Epling *et al*., 2016. Screening for colorectal cancer: US preventive services task force recommendation statement. J. Am. Med. Assoc., 315: 2564-2575.
11. Anderson, L.M. and D.S. May, 1995. Has the use of cervical, breast and colorectal cancer screening increased in the United States? Am. J. Public Health, 85: 840-842.
12. Lo, S.H., J. Waller, J. Wardle and C. von Wagner, 2013. Comparing barriers to colorectal cancer screening with barriers to breast and cervical screening: A population-based survey of screening-age women in Great Britain. J. Med. Screen., 20: 73-79.
13. Shokar, N.K., C.A. Carlson and G.S. Shokar, 2006. Physician and patient influences on the rate of colorectal cancer screening in a primary care clinic. J. Cancer Educ., 21: 84-88.
14. Siegel, R. and A. Jemal, 2011. Colorectal cancer facts & figures, 2011-2013. American Cancer Society, Atlanta, Georgia.
15. Omran, S. and A.A. Ismail, 2010. Knowledge and beliefs of Jordanians toward colorectal cancer screening. Cancer Nurs., 33: 141-148.
16. Stacy, R., W.A. Torrence and C.R. Mitchell, 2008. Perceptions of knowledge, beliefs and barriers to colorectal cancer screening. J. Cancer Educ., 23: 238-240.
17. Bidouei, F., S. Abdolhosseini, N. Jafarzadeh, A. Izanloo and K. Ghaffarzadehgan *et al*., 2014. Knowledge and perception toward colorectal cancer screening in East of Iran. Int. J. Health Policy Manage., 3: 11-15.
18. Xilomenos, A., D. Mauri, K. Kamposioras, A. Gkinosati and G. Zacharias *et al*., 2006. Colorectal cancer screening awareness among physicians in Greece. BMC Gastroenterol., Vol. 6, No. 1. 10.1186/1471-230X-6-18
19. Boehler, M., V. Advani, C.J. Schwind, E.D. Wietfeldt and Y. Becker *et al*., 2011. Knowledge and attitudes regarding colorectal cancer screening among medical students: A tale of two schools. J. Cancer Educ., 26: 147-152.
20. Ramos, M., M. Esteva, J. Almeda, E. Cabeza and D. Puente *et al*., 2010. Knowledge and attitudes of primary health care physicians and nurses with regard to population screening for colorectal cancer in Balearic Islands and Barcelona. BMC Cancer, Vol. 10, No. 1. 10.1186/1471-2407-10-500.
21. Galaychuk, I., 2000. Training of medical students and nurses to be members of cancer care teams. J. Cancer Educ., 15: 65-68.
22. Hauer, K.E., K. Wilkerson and A. Teherani, 2008. The relationship between medical student's knowledge, confidence, experience and skills related to colorectal cancer screening. J. Cancer Educ., 23: 209-213.
23. Omran, S., H. Barakat, J.K. Muliira and N. Aljadaa, 2015. Knowledge, experiences and barriers to colorectal cancer screening: A survey of health care providers working in primary care settings. J. Cancer Educ., 30: 53-61.
24. Ebu, N.I., S.C. Mupepi, M.P. Siakwa and C.M. Sampselle, 2015. Knowledge, practice and barriers toward cervical cancer screening in Elmina, Southern Ghana. Int. J. Women's Health, 7: 31-39.

25. Gennarelli, M., L. Jandorf, C. Cromwell, H. Valdimarsdottir, W. Redd and S. Itzkowitz, 2005. Barriers to colorectal cancer screening: Inadequate knowledge by physicians. Mount Sinai J. Med. N. Y., 72: 36-44.
26. Jones, R.M., K.J. Devers, A.J. Kuzel and S.H. Woolf, 2010. Patient-reported barriers to colorectal cancer screening: A mixed-methods analysis. Am. J. Preventive Med., 38: 508-516.
27. Marlow, L.A.V., J. Waller and J. Wardle, 2015. Barriers to cervical cancer screening among ethnic minority women: A qualitative study. Br. Med. J., 41: 243-244.
28. Mayo, R.M., W.W. Sherrill, S.F. Griffin and V.G. Parker, 2012. Content, placement and acquisition of cancer education for Latino patient care: A qualitative study of medical and nursing students. J. Cancer Educ., 27: 618-624.
29. Farooqui, M., M.A. Hassali , Knight A, Shafie AA, Farooqui MA, *et al*., 2013. A qualitative exploration of Malaysian cancer patients' perceptions of cancer screening. BMC Public Health, 10.1186/1471-2458-13-48
30. Sung, J.J.Y., S.Y.P. Choi, F.K.L. Chan, J.Y.L. Ching, J.T.F. Lau and S. Griffiths, 2008. Obstacles to colorectal cancer screening in Chinese: A study based on the health belief model. Am. J. Gastroenterol., 103: 974-981.
31. Deng, S.X., J. Gao, W. An, J. Yin, Q.C. Cai, H. Yang and Z.S. Li, 2011. Colorectal cancer screening behavior and willingness: An outpatient survey in China. World J. Gastroenterol., 17: 3133-3139.
32. Tastan, S., I.I. Andsoy and E. Iyigun, 2013. Evaluation of the knowledge, behavior and health beliefs of individuals over 50 regarding colorectal cancer screening. Asian Pac. J. Cancer Prev., 14: 5157-5163.