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The Diagnosis Rate of Colorectal Carcinoma Through Cancer Screening Programs

Colorectal Cancer Screening

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ABSTRACT

Objective: This study aimed to assess the diagnosis rate of colorectal cancer through screening programs, examine the influence of personal and environmental risk factors on its development, and evaluate awareness of colorectal cancer screening programs.
Materials and Methods: Patients aged 50 and above, diagnosed with colorectal carcinoma at the Medical Oncology Outpatient Clinic of Izmir Katip Celebi University Ataturk Education and Research Hospital, were included in this study. Participants completed a survey to assess their knowledge of screening programs and risk factors. Clinical and demographic data were collected retrospectively from medical records.
Results: Among the 130 patients included, 23 (17.6%) were diagnosed through screening, while 107 (82.4%) were diagnosed without screening. The mean age of patients diagnosed through screening was significantly younger (58.7 years) than those diagnosed without screening (63.7 years). Screening-diagnosed patients were identified at earlier cancer stages, with a lower proportion presenting with advanced T stages (T1–T2: 5.9%; T3–T4: 94.1%). Metastasis was present in 44.6% of patients overall, with 8 cases in the screening group. Awareness of Early Diagnosis, Screening, and Training Centers (KETEMs) was reported by only 20.8% of participants. Patients aware of KETEMs were more likely to undergo screening (56.5%) than those unaware (43.5%, $p < 0.001$).
Conclusion: Patients diagnosed through screening were younger and presented with less advanced disease. Familiarity with KETEMs was significantly associated with increased screening participation. Enhancing public awareness and education regarding colorectal cancer screening programs is essential to improve early detection and reduce mortality rates.

Kolorektal Karsinom Tanısı Alan Hastalarda Kanser Tarama Programı ile Tanı Konulma Oranı

Kolorektal Kanserde Tarama

Makale Bilgisi

Makale Geçmişi
Geliş Tarihi: 30/09/2024
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Anahtar Kelimeler:
Kolorektal kanser,
KETEM,
Risk faktörleri.

ÖZET

Amaç: Kolorektal kanser tanısı almış hastalarda tarama programlarıyla tanı konulma oranını araştırmak, kişisel ve çevresel risk faktörlerinin kolorektal kanser gelişimine etkisini ve kolorektal kanser tarama programları farkındalıklarını incelemek amaçlanmıştır.
Gereç ve Yöntemler: Çalışmaya İKÇÜ Atatürk Eğitim Araştırma Hastanesi Tıbbi Onkoloji polikliniğinde, kolorektal karsinom tanısı almış 50 yaş üstü hastalar dahil edilmiştir. Hastalara tarama programları hakkındaki bilgilerini ve risk faktörlerini değerlendirmeye yönelik anket yöneltilmiştir. Klinik-demografik veriler tıbbi onkoloji poliklinik dosya kayıtlarından elde edilmiştir.
Bulgular: Çalışmaya 130 hasta dahil edilmiştir. Taramayla tanı alan 23, taramayla tanı almayan 107 hasta saptanmıştır. Tarama ile tanı alanların yaş ortalaması 58,7, taramayla tanı almayanların yaş ortalaması 63,7 olup taramayla tanı alan hastalar daha erken yaşta tanı almıştır. Hastaların %2,4'ü T1, %3,5'i T2, %47,1'i T3, %47,1'i T4 evresinde tanı almıştır. Tarama ile tanı alan hastaların T evresi tarama ile tanı almayan hastalara göre düşük saptanmıştır. Tanı sırasında metastaz saptanan 58 kişiden 8'i taramayla tanı alan gruptadır. Hastaların %79,2'sinin KETEM hakkında bilgisi olmadığı saptanmıştır. KETEM hakkında bilgi sahibi olanların %56,5'i taramayla tanı almış, %13,1'i tarama programına katılmadan tanı almıştır. KETEM hakkında bilgi sahibi olmanın, tarama ile tanı almayla anlamlı bir ilişkisi olduğu bulunmuştur. Çalışmaya katılan hastaların tarama programıyla tanı konulma oranı %17,6'dır.
Sonuç: Bu çalışmada taramayla tanı almış hastaların daha erken yaşta, daha düşük T evresinde tanı aldıkları ve KETEM hakkında bilgisi olanların tarama programına katılımlarının daha yüksek olduğu saptanmıştır. Kolorektal kanserin daha erken evrede tespiti ve mortalitesinin azaltılması için tarama programlarına katılım çok önemlidir. Tarama programları hakkında toplumun bilinçlendirilmesi ve bilgi düzeylerinin arttırılması için çalışmalar yapılması gerekmektedir.

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Introduction

Colorectal cancer is the most prevalent cancer of the gastrointestinal system (1). According to the Turkish Statistical Institute (TUIK), it was the fourth leading cause of cancer-related deaths in 2017 (2). Its incidence begins to rise after the age of 40, peaking between ages 60 and 70 (3). Screening programs, combined with advancements in therapeutic and surgical approaches, have proven effective in reducing both the incidence and mortality rates of colorectal cancer (4).

Key risk factors for colorectal cancer include age, genetic predisposition, and dietary habits. It is most commonly observed in individuals aged 50 and older. A family history of colorectal cancer in first- or second-degree relatives and the presence of polyps further elevate the risk (5). Additional contributors include smoking, physical inactivity, obesity, a low-fiber diet, and excessive red meat consumption (6).

The early symptoms of colorectal cancer are often nonspecific. Common signs include changes in bowel habits, rectal bleeding, weight loss, anorexia, iron deficiency, and anemia (7). While early-stage colorectal cancer is primarily treated surgically, radiotherapy and chemotherapy may also be necessary depending on disease progression (8).

In Turkey, colorectal cancer screening involves fecal occult blood tests performed every two years for individuals aged 50 to 70 through Cancer Early Diagnosis, Screening, and Education Centers (KETEMs) and Family Health Centers. Additionally, colonoscopy is recommended every 10 years for individuals over the age of 50 (9). Advanced diagnostic techniques, such as computed tomography, fecal DNA testing, and capsule endoscopy, are also employed when necessary (10).

This study aimed to evaluate whether patients diagnosed with colorectal cancer at the Medical Oncology Clinic of Atatürk Education and Research Hospital, Izmir Katip Celebi University, had prior exposure to KETEM services or participation in screening programs. Furthermore, it assessed the influence of personal and environmental risk factors on colorectal cancer development and examined patients' awareness of colorectal cancer screening programs.

Materials and Methods

Ethics approval for this non-interventional study was obtained from the Clinical Research Ethics Committee of Izmir Katip Celebi University. Data were analyzed retrospectively. The study included patients aged 50 and older who were diagnosed with colorectal carcinoma at the Medical Oncology Outpatient Clinic of Izmir Katip Celebi University Ataturk Education and Research Hospital and were receiving treatment and/or follow-up care. Participants who agreed to take part in the study completed a 14-question survey designed to evaluate their knowledge of screening programs and associated risk factors. Clinical and demographic data were extracted from outpatient medical records.

A total of 144 patients volunteered to participate in the survey. Fourteen patients

were excluded due to incomplete clinical or demographic data or a diagnosis under the age of 50, resulting in a final sample size of 130 participants.

Data analysis was conducted using IBM SPSS Statistics Standard Concurrent User V26 (IBM Corp., Armonk, New York, USA). Descriptive statistics included sample size (n), percentage (%), mean ± standard deviation (mean ± sd), median (M), minimum (min), and maximum (max) values. The Shapiro-Wilk test was used to evaluate the normality of numerical variables, and Levene's test assessed the homogeneity of variances. Since the data did not follow a normal distribution, nonparametric tests were applied. The Mann-Whitney U test was used to compare single-measure numerical variables (e.g., mean ages). Categorical variables were analyzed using Fisher's Exact test and Chi-Square test. Frequency tables and crosstabs were generated for descriptive purposes. Statistical significance was set at $p < 0.05$.

Fisher's Exact test was used to compare educational status and the presence of family and personal histories of cancer between patients diagnosed through screening and those diagnosed without screening. Additionally, Fisher's Exact test was employed to compare T stage between the two groups, while Pearson's Chi-Square test was applied to assess differences in lymph node metastasis and distant metastasis at diagnosis.

Results

The study included 130 patients. Table 1 summarizes the patient characteristics, while Table 2 compares these characteristics based on screening status.

The mean age of patients diagnosed through screening (n = 23) was 58.7 years, significantly lower than the mean age of 63.7 years for those diagnosed without screening (n = 107; p = 0.007).

Regarding reasons for hospital admission, 48 patients (36.9%) presented with abdominal pain and swelling, 33 (25.4%) with constipation, 14 (10.8%) with rectal bleeding, 11 (8.5%) with fatigue and weight loss, 8 (6.2%) with diarrhea, and 4 (3.1%) for other reasons (e.g., rectal discharge, polyps, ulcers). Additionally, 12 patients (9.2%) were diagnosed during routine check-ups without complaints.

Participants were grouped into five educational levels: 64.6% (n = 84) completed primary school, 11.5% (n = 15) secondary school, 12.3% (n = 16) high school, 10.8% (n = 14) university, and 0.8% (n = 1) postgraduate studies. Educational levels did not differ significantly between screening and non-screening groups (p = 0.083).

Cancer staging

T and N stages were classified based on AJCC criteria. Excluding patients with metastasis or undetermined staging, 2.4% of participants were at T1, 3.5% at T2, 47.1% at T3, and 47.1% at T4. Among screening-diagnosed patients, lower T stages were observed (p = 0.003).

- T1: 0% (non-screened) vs. 8.7% (screened)
- T2: 2.8% (non-screened) vs. 0% (screened)

- T3: 37.8% (non-screened) vs. 52.2% (screened)
- T4: 59.4% (non-screened) vs. 13% (screened).

Lymph node involvement (N stage) was assessed in 85 participants. Among them, 40% (n = 34) were at N0, 37.6% (n = 32) at N1, and 22.4% (n = 19) at N2. Although no significant difference in lymph node metastasis was observed between groups (p = 0.066), screening-diagnosed patients showed fewer cases of advanced N staging.

Metastasis was identified in 44.6% (n = 58) of all participants at diagnosis, with 8 cases in the screening group. Although the proportion of metastasis was lower among screened patients, the difference was not statistically significant (p = 0.296).

Risk factors and lifestyle

- Smoking: 63.8% (n = 83) were non-smokers, and 36.2% (n = 47) were smokers.
- Alcohol: 83.8% (n = 109) did not consume alcohol, while 16.2% (n = 21) did.
- Ulcerative colitis: Present in 6.2% (n = 8).
- Fatty food consumption: 41.5% (n = 54) consumed high-fat diets.
- Polyps: 11.5% (n = 15) had a history of polyps.

The mean body mass index (BMI) was 25.68 kg/m².

Family and personal history

- Family history of cancer was reported by 21.7% (n = 5) of screened patients and 14% (n = 15) of non-screened patients (p = 0.350).
- Concomitant cancers were found in 4.3% (n = 1) of screened patients and 5.6% (n = 6) of non-screened patients (p = 1.000).

Screening participation

Of the 130 patients, 36.9% (n = 48) participated in screening programs, while 63.1% (n = 82) did not. Among screened patients, 25.4% (n = 33) underwent colonoscopy only, 4.6% (n = 6) had a fecal occult blood test (FOBT) only, and 6.9% (n = 9) had both tests.

Awareness of KETEM

Participants were divided into those informed (20.8%, n = 27) and unaware (79.2%, n = 103) of KETEM. Among informed participants, 56.5% were diagnosed through screening, compared to 43.5% of uninformed participants. Awareness of KETEM was significantly associated with screening participation (p < 0.001).

Overall, 17.6% (n = 23) of participants were diagnosed through the screening program, with a screening diagnosis rate of 47.9% among those who participated.

Discussion

Colorectal cancer ranks as the fourth leading cause of cancer-related deaths globally (2). Reducing mortality rates requires the implementation of effective screening programs, advancements in treatment, and improved surgical techniques.

A study by Kilickap et al. focused on patients aged 18 years and older, while our study targeted a more specific cohort of individuals aged 50 years and above. Despite this difference, the mean age of participants was

comparable, with 58.7 years in our study and 56 years in theirs. Additionally, 15.3% of our patients reported a family history of colorectal cancer, slightly higher than the 12% reported in Kilickap et al.'s study. Participation in screening programs was also higher in our study (36.9%) compared to theirs (20%), likely due to the inclusion of fecal occult blood test (FOBT) alongside colonoscopy (11).

In a study by Izbul and Muderriszade, 52.3% of patients were aged between 60 and 80 years, with a mean age of 65.2 years (12). Consistent with these findings, our study reported a mean age of 58.7 years for patients diagnosed through screening and 63.7 years for those diagnosed without screening.

Altun H.'s thesis study, which included 60 patients aged 36 to 80, reported a mean age of 62.5 years, similar to our results (13). However, Altun H.'s study reported no significant relationship between educational level and participation in screening programs ($p = 0.391$). In contrast, other studies, such as those by Swan et al. and Frederiksen et al., found significant associations between higher educational attainment and participation in screening programs, particularly colonoscopy (14, 15). Our study did not observe such a relationship ($p = 0.083$).

Regarding presenting symptoms, Turan et al. identified rectal bleeding (62.6%), constipation (51.2%), and abdominal pain (47.2%) as the most common reasons for seeking medical attention (16). Similarly, our study reported abdominal pain and swelling (36.9%), constipation (25.4%), and rectal bleeding (10.8%) as the top three symptoms, although the relative frequencies differed.

Family history of colorectal cancer was present in 15.3% of our patients, consistent with findings by Turan et al. (13.8%) and Altun H. (10%) (13, 16). A history of other cancers was reported by 5.4% of our patients, lower than the 10.5% reported by Turan et al.

The male-to-female ratio in our study was 1.3, aligning with Izbul and Muderriszade's findings (1.2) but differing slightly from Ozkan et al.'s ratio of 1.7, which highlights a higher prevalence of colorectal cancer among men (12, 17).

Screening methods in our study were predominantly colonoscopy (25.4%) and FOBT (4.6%), with 6.9% of patients undergoing both. These findings align with Izbul and Muderriszade's study, where colonoscopy was the primary diagnostic tool (76%) (12). Ozkan et al. reported that increased adoption of screening tests has contributed to declining colorectal cancer incidence in Turkey and the USA over the past two decades (17).

In Diyarbakirlioglu et al.'s study, 72.2% of patients had no metastasis, compared to 55.4% in our cohort. This difference may reflect variations in study populations and access to early detection programs (18).

Altug et al. reported a screening participation rate of only 0.3% in the general population, significantly lower than the 36.9% in our study (19). This disparity likely arises from differences in study focus; our research specifically targeted patients already diagnosed with colorectal cancer, many of whom underwent screening.

Altun H. found that 43.3% of patients did not participate in screening due to a lack of

information (13). Similarly, 79.2% of our participants were unaware of KETEM, emphasizing the need for better public education. Awareness of KETEM was significantly associated with screening participation ($p < 0.001$).

Internationally, awareness and participation in screening programs are higher, with rates exceeding 65% in the USA, leading to lower colorectal cancer mortality (20, 21). In Turkey, participation rates range between 20% and 30%, as reported by the Ministry of Health (22). Our study's rate of 36.9% indicates progress but underscores the need for further improvement.

Dietary habits were also explored. Aune et al.'s meta-analysis demonstrated that high-fiber diets reduce colorectal cancer risk (24). In our study, 41.5% of participants consumed high-fat diets, and the mean BMI of 25.67 indicated that most were overweight, consistent with findings by Altun H. (13).

Lastly, Jess et al. highlighted the increased risk of colorectal cancer among patients with ulcerative colitis, estimating a 1.6% risk over 14 years (25). Our study reported a higher prevalence of ulcerative colitis (6.2%) among participants, likely reflecting our focus on a colorectal cancer cohort.

Conclusion

Colorectal cancer risk factors include being over 50 years old, consuming a high-fat diet, smoking, alcohol use, obesity, a family history of colorectal cancer, and a personal history of polyps or ulcerative colitis. High-risk individuals should undergo regular screening and monitoring through primary care physicians or KETEM centers to facilitate early detection.

Our findings demonstrate that patients diagnosed through screening were younger and presented with a lower T stage, emphasizing the critical role of screening tests in detecting colorectal cancer at earlier stages and reducing mortality rates.

Furthermore, our study revealed a significant association between awareness of KETEM and participation in screening programs. These results highlight the importance of raising public awareness and enhancing education about the benefits of colorectal cancer screening programs to improve early diagnosis and survival outcomes.

Limitations

A key limitation of our study is the inability to include all patients diagnosed with colorectal cancer who were treated at the Medical Oncology Outpatient Clinic of Izmir Katip Celebi University Ataturk Education and Research Hospital. This may have resulted in a selection bias and limited the generalizability of our findings.

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Author contributions

Concept: BA, BC, IK, KD, ENC, BBK.
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References

1. Borig CC., Squires TS., Tong T. Cancer statistics. CA Cancer J Clin 1993; 43(1):7-26. Doi: 10.3322/canjclin.43.1.7
2. Turkish Statistical Institute. Cause of death statistics. Number: 27620, 2018.
3. Ministry of Health, Cancer Registry (Internet). (cited 2021 May 5) Available from: http://www.kanser.gov.tr/index.php/daire-faaliyetleri/kanser-kayitciligi.html
4. Golfinopoulos V., Salanti G., Pavlidis N., Ioannidis J PA. Survival and disease-progression benefits with treatment regimens for advanced colorectal cancer: a meta-analysis. Lancet Oncol 2007; 8(10):898-911. Doi: 10.1016/S1470-2045(07)70281-4
5. Curuk GN., Yuceler Kacmaz H. Prevention of colorectal cancer and responsibilities of nurses. Gumushane University Journal of Health Sciences 2017; 6(4):224-33.
6. Vaizoglu SA., Turhan T., Temel F., et al. Evaluation of factors associated with colorectal cancer and compliance with fecal occult blood testing in individuals aged 50 and above in primary care. Turkish Journal of Geriatrics 2010; 13(2):79-86.
7. Aydinli M. Evaluation of the status and diagnostic process of patients diagnosed with colorectal cancer from a preventive medicine perspective. Published Master's Thesis. Ankara University, Ankara, 2011.
8. Ozgeren E., Kisli E., Aydın M., et al. Treatment approaches in colorectal cancers. Van Medical Journal, 2001; 8(4):125-27.
9. Ministry of Health. Colorectal cancer. (Internet). (cited 2021 Feb 4) Available from: https://hsgm.saglik.gov.tr/tr/haberler/kal%C4%B1n-ba%C4%9F%C4%B1rsak-kanseri-kolorektal-kanser.html
10. Ministry of Health. Colorectal cancer screening guidelines. (Internet). (cited 2021 May 3) Available from: http://kanser.gov.tr/Dosya/tarama/kolorektal.pdf
11. Kilickap S., Arslan C., Rama D., Yalcin S. Screening colonoscopy participation in Turkish colorectal cancer patients and their first degree relatives. Asian Pac J Cancer Prev 2012; 13(6):2829-32. Doi: 10.7314/apjcp.2012.13.6.2829
12. Izbul T., Muderriszade M. Retrospective analysis of colorectal cancer cases diagnosed in the Turkish Republic of Northern Cyprus. Academic Journal of Gastroenterology 2003; 2(1):7-10.
13. Altun H. Evaluation of knowledge and attitudes regarding cancer screening among patients diagnosed with colorectal cancer. (Master's Thesis). Bursa Uludag University, 2019.
14. Swan J., Breen N., Coates RJ., Rimer BK., LEE NC. Data and trends in cancer screening in the united states. Cancer 2003; 97:1528-40. Doi: 10.1002/cncr.11208
15. Frederiksen BL., Jørgensen T., Brasso1 K., Holten I., Osler M. Socioeconomic position and participation in colorectal cancer screening. Scand J Gastroenterol 2010; 45(10): 1211-6.
16. Turan Y., Yanlis BM., Yucel I., Unal M. The epidemiological features of the newly onset colorectal cancer patients. Turkish Journal of Family Practice 2012; 16(4):169-77. Doi: 10.2399/tahd.25744
17. Ozkan OF., Kaya U., Guner A., et al. Demographic distribution and disease characteristics of colorectal cancer patients in a training and research hospital. Pam Med J 2012; 5(3):132-35.
18. Diyarbakirlioglu C., Gursu RU., Muderrisoglu C., Polat H., Ulas N., Gur C. The demographic characteristics of patients with colon cancer and response to treatment. Istanbul Med J 2014; 15:199-202. Doi 10.5152/imj.2014.05900
19. Altug E., Burhanoglu S., Erkek AB., Kuzu MA. Physicians' approach to screening tests used in the early diagnosis of colorectal cancers. Current Gastroenterology 2002; 3:25-8.
20. Centers for Disease Control & Prevention. Colorectal cancer screening in the United States. (Internet) 2016; (June) (cited 2022 May 17): Avalible from: https://www.cdc.gov/brfss/annual_data/annual_2016.html.
21. Edwards BK., Ward E., Betsy AK., et al. Annual report to the nation on the status of cancer, 1975–2006, featuring colorectal trends and impact of interventions (risk factors, screening, and treatment) to reduce future rates. Cancer 2010; 116(3):544-73. Doi: 10.1002/cncr.24760.
22. Ministry of Health, Republic of Turkey. Colorectal cancer screenings - screening programs. 2017; 91:399-404.
23. Pirincci S., Benli C., Okyay P. Awareness study on colorectal cancer screening programs among patients attending a tertiary care health center. TAF Preventive Medicine Bulletin 2015; 14(3):209-14.
24. Aune D., Lau R., Chan DSM., et al. Nonlinear reduction in risk for colorectal cancer by fruit and vegetable ıntake based on meta-analysis of prospective studies. Gastroenterology 2011; 141(1):106-18. Doi: 10.1053/j.gastro.2011.04.013
25. Jess T., Rungoe C., Peyrin-Biroulet L. Risk of colorectal cancer in patients with ulcerative colitis: a meta-analysis of population-based cohort studies. Clin Gastroenterol Hepatol 2012; 10(6):639-45. Doi: 10.1016/j.cgh.2012.01.01054(8):2057-62. Doi:10.1016/j.transproceed.2022.08.021..

Table 1. Patient Characteristics

Variables	Statistics
Cause of presentation, *n* (%)	
No complaints/Check-up	12 (9.2)
Constipation	33 (25.4)
Abdominal Pain/Swelling	48 (36.9)
Bleeding	14 (10.8)
Diarrhea	8 (6.2)
Fatigue/Weight Loss	11 (8.5)
Other	4 (3.1)
Smoking status, *n* (%)	
Non-smoker	83 (63.8)
Smoker	47 (36.2)
Alcohol, *n* (%)	
No alcohol use	109 (83.8)
Alcohol use	21 (16.2)
Ulcerative Colitis, *n* (%)	
Yes	8 (6.2)
No	122 (93.8)
Fatty Food Consumption, *n* (%)	
Yes	54 (41.5)
No	76 (58.5)
History of Polyps, *n* (%)	
No	115 (88.5)
Yes	15 (11.5)
BMI, (kg/m^2)	
$\underline{x}\pm sd$	25.67±4.70
M (*min-max*)	25.29 (16.05-44.44)
Participation in Screening, *n* (%)	
No screening	82 (63.1)
Underwent screening	48 (36.9)
Screening Test, *n* (%)	
Colonoscopy	33 (25.4)
Fecal occult blood test (FOBT)	6 (4.6)
Colonoscopy and FOBT	9 (6.9)
None	82 (63.1)

$\underline{x}$: Mean, *sd*: Standard deviation, *M*: Median, %: Percentage

Table 2. Comparison of Patient Characteristics by Screening Groups

	Groups		Test Statistics	
	Diagnosed without screening	Diagnosed through screening	Test Value	*p* value
Age at Diagnosis, years $\underline{x}$±*sd* *M* (*min-max*)	63.69±8.28 63 (50-82)	58.65±5.54 59 (51-69)	*z*=2.712	**0.007**
Educational Level, *n* (%) Primary School Secondary School High School Undergraduate Graduate	 74 (69.2) 11 (10.3) 10 (9.3) 11 (10.3) 1 (0.9)	 10 (43.5) 4 (17.4) 6 (26.1) 3 (13) 0 (0)	χ^2=7.422	0.083
T Stage, *n* (%) T1 T2 T3 T4	 0 (0) 3 (4.4) 28 (41.2) 37 (54.4)	 2 (11.8) 0 (0) 12 (70.6) 3 (17.6)	χ^2=15.156	**0.003**
N Stage, *n* (%) N0 N1 N2	 23 (33.8) 28 (41.2) 17 (25)	 11 (64.7) 4 (23.5) 2 (11.8)	χ^2=5.433	0.066
Metastasis, *n* (%) No Yes	 57 (53.3) 50 (46.7)	 15 (65.2) 8 (34.8)	χ^2=1.093	0.296
Family History of Cancer, *n* (%) Yes No	 15 (14) 92 (86)	 5 (21.7) 18 (78.3)	χ^2=0.867	0.350
Concomitant Cancer, *n* (%) Yes No	 6 (5.6) 101 (94.4)	 1 (4.3) 22 (95.7)	χ^2=0.603	1.000
Informed about KETEM, *n* (%) No Yes	 93 (86.9) 14 (13.1)	 10 (43.5) 13 (56.5)	χ^2=47.738	**0.0001**

$\underline{x}$: Mean *sd*: Standard deviation, *M*: Median, %: Percentage, χ^2: Chi square test value, z: Mann-Whitney U test