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RESEARCH ARTICLE

QUALITY OF LIFE AND COST OF LIVING IN COLON CANCER PATIENTS

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Abstract

Introduction: Colon cancer is a common form of cancer. The main goal of any therapeutic approach is the patient's best quality of life combined with the effectiveness of the treatment.

Aim: To explore the quality of life of patients with colon cancer in Greece as well as to estimate the change in their cost of living.

Material and methods: This is a prospective descriptive observational study, conducted during the period January 2020- January 2022. In total, 192 participants were enrolled in the study. Data collection was performed by using a questionnaire both open-ended and closed-ended questions (demographic, socioeconomic and lifestyle characteristics, questions for the assessment of the changes in patients' financial cost of living and their quality of life). Data analysis was performed using SPSS ver. 21.0 (Statistical Package for Social Sciences).

Results: The mean age of the patients was 66.7 years, while 39.6% were women. The majority of patients (73.4%) were retired and 14.6% were employed. The average cost of living of the patients due to the disease during the previous semester was €3.714. Scores on the mental and physical health summary scales were significantly lower than 50 indicating that patients' quality of life was significantly worse than average in both mental and physical health. Younger patients had better general health, p=0.047.

Conclusion: The generally reduced quality of life for patients with colon cancer, can be interpreted in relation to the increased anxiety of patients, pain, as well as the significant financial burden they face.

Keywords: Quality of life, cost of living, colon cancer.

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INTRODUCTION

Colon cancer is a relatively common form of cancer. While death rates from colorectal cancer have declined since the early 1970s as a result of earlier detection and better treatment, it remains the third most common cancer in both men (after lung cancer and prostate cancer) and in women (after breast cancer and lung cancer), but also the second most common cause of cancer death overall. If colon cancer is diagnosed at an early stage, the five-year survival rate increases to 93%. More than half of colon cancer cases are linked to lifestyle and environmental factors including: diet, obesity, physical activity, alcohol and tobacco, oral contraceptives and other medications, family history.[1,2]

The treatment approach to colon cancer depends on the location and stage of the cancer, as well as the general health and preferences of the patient. The earlier it is diagnosed, the more effective its removal. The main goal of any therapeutic approach is the patient's quality of life combined with the effectiveness of the treatment. Quality of Life (QoL) refers to various dimensions of a person's daily life, such as their functionality, their well-being as well as the general perception of their health at a physical, psychological and social level. Its assessment, however, is rather challenging since it depends on the beliefs and perceptions of the individual as well as on their personal assessment of his situation. Consequently, an individual's quality of life can be defined as his own perception of his position in society to which he belongs, but also of the value system of this society, in combination with his goals and expectations.[3]

Several researchers have assessed QoL in patients with colorectal cancer in relation to psychosocial, demographic and/or clinical factors, and specific QoL assessment tools in different languages have been developed. In the English literature, most studies on patients with colon cancer deal exclusively with recording their quality of life.[4-8] Few have dealt with recording costs related to the disease,[9,10] while no studies were found that correlated these two variables.

AIM

The aim of the present study was to explore the quality of life for patients with colon cancer in Greece as well as to estimate the change in their cost of living. A supplementary objective was to assess the effect of cost of living on their quality of life.

METHODS

Study design

This is a prospective descriptive observational study, conducted during the period January 2020 - January 2022. The study was approved by the Ethics Committee of tertiary-level Oncology hospital, in Attica, Greece.

Sample

The final sample size was determined by specific time and condition constraints. This study was conducted during the recent COVID-19 pandemic so the impact on sampling recruitment methods should be taken into consideration.

According to the inclusion criteria participants should communicate effectively in the Greek language and should be over the age of 18. A total of 200 colon cancer patients were primarily approached and invited to take part in the study. Of those, 198 consented in participating and filling in the questionnaire of the study (response rate 99%). Finally, 192 participants were enrolled, as 6 were excluded from the study. Exclusion criteria was incomplete answers (n=6).

Measurements

The final form of the questionnaire included both open-ended and closed-ended questions. The first part of the questionnaire concerned demographic, socioeconomic and lifestyle characteristics. The second part of the questionnaire was used for the assessment of the changes in patients' financial cost of living (which includes open-ended questions regarding both the financial cost due to illness and the loss of income due to job changes or other forced expenses to deal with the consequences of the disease). The questionnaire was created by Stergiannis et al.,[11] and permission has been obtained for its use. Finally, the third part of the questionnaire included the tool used to assess patients' quality of life by using the Short Form Questionnaire-36 – SF 36 (which includes questions that explore the physical functioning of the individual, its physical role, physical pain, overall health as well as its vitality and social function. In addition, it includes questions concerning the

role of emotions as well as his mental health.[13]

Data collection

The first author informed the participants of the purpose and the nature of the study. Once participants voluntarily agreed to participate, they were given an envelope containing the questionnaire of the study and an informed consent form. The questionnaire was distributed in person by the first author. Upon completion the questionnaire and the signed consent form were returned to the first author in a closed envelope, in order to maintain the anonymity and confidentiality of the data.

Ethics

Written informed consent was obtained from all study participants in order to participate in the research. Study participants were informed about the purpose of the study, the confidentiality of data and the voluntary nature of participation. During the conduct of this study, all the basic principles of ethics provided by the Declaration of Helsinki were imposed.

Data analysis

Continuous variables are presented as mean values ± standard deviation and categorical variables as frequencies. The Kolmogorov-Smirnov test and normality plots were used to test for normal distribution of quantitative variables. Several statistical tests were used for bivariate relationships. Mann-Whitney test, to investigate the existence of a relationship between a quantitative variable that did not follow a normal distribution and a dichotomous variable. Kruskal-Wallis test to investigate the existence of a relationship between a quantitative variable that did not follow a normal distribution and a categorical variable with >2 categories. Data analysis was performed using SPSS ver. 21.0 (Statistical Package for Social Sciences). A probability level of less or equal to 0.05 was considered significant.

RESULTS

Demographic characteristics

The studied sample included 192 patients with colon cancer and their demographic characteristics are presented in Table 1. The mean age of the patients was 66.7 years, while 39.6% were women and 60.4% were men. As far as family status is concerned, 69.2% of patients were married and 17.7% were widowed. Most patients had children (88.4%) and lived with someone else (81.8%). Similarly, most patients resided permanently in Attica (84.6%). Regarding the educational level, 26% were elementary school graduates, 25% were high school graduates, 18.2% had a TEI/HEI degree, 14.6% were high school graduates, 13.5% were IEK graduates and 2.6% were illiterate.

The occupational characteristics of the patients are shown in Table 2. The majority of patients (73.4%) were retired, 14.6% were employed and 12% were unemployed. Among employees, 73.9% worked ≤40 hours per week. All patients had a broad insurance coverage for health problems and most of them belonged in the Greek National Health Service Organization (EOPPY) (64.6%) or in a public health service organization (26.6%). Over half of the studied sample (65.1%) had a monthly family income of ≤1000€, 26% had 1001-1500€ and 8.8% had >1500€. The average number of days the patients were absent from work during the previous semester was 100, while the average number of days absent from work for the family members during the previous semester was 20. In detail, the patients' cost of living due to the disease during the previous six months is presented in Table 3. The average cost of living of the patients due to the disease during the previous semester was €3.714. The lowest average cost price was €115 and the highest price was €19,515.

Use of health services and quality of life

Almost all patients had been admitted to hospital during the previous six months (91.7%). 71.4% of the patients had received a special diet or food supplements and 4.2% had made changes in their home due to the disease. The number of used health services by patients during the previous semester is presented in detail in Table 4. Table 5 presents the Cronbach's alpha internal consistency coefficients for the scales of the SF-36 for the assessment of quality of life. Cronbach's alpha internal consistency coefficients ranged from 0.72 to 0.92, indicating very good reliability of the SF-36. Descriptive results for the SF-36 scales are presented in Table 6. Higher SF-36 values also indicate better quality of life. Scores on the mental and physical health summary scales were significantly lower than

50 indicating that patients' quality of life was significantly worse than average in both mental and physical health.

The highest mean score was on the 'physical pain' scale and the lowest mean score was on the 'social functioning' scale. Younger patients had better general health, p=0.047

DISCUSSION

The assessment of mental and physical health found that patients' quality of life was significantly worse than average, with "physical pain" being the most important factor and "social functioning" being the least important factor. Regarding physical health and physical role it was found that men and younger patients as well as patients with lower total cost of living had better physical health and physical role. Regarding mental health, it was found that men, permanent residents of Attica, as well as patients with a lower total cost of living had better mental health. Accordingly, in the domain of physical functioning, it was found that men, younger patients, patients with higher monthly family income and those with lower total cost of living had better physical functioning. Additionally, the research showed that patients with lower total cost of living had less physical pain and that younger patients had better overall health. Next, assessing vitality, it was found that men, younger patients, and patients with a lower total cost of living had greater vitality. Various variables were shown to influence the social role, while it was also found that men, younger patients, patients with higher family income and those with a lower cost of living as well as the residents of Attica had a better social role. Regarding the emotional role of patients, it was found that men, younger patients as well as those with a lower cost of living had a better emotional role. Finally, the research showed that younger patients, patients with higher monthly family income had better mental health, those with lower total living costs had better mental health and those who permanently resided in Attica had better mental health. From the above, it can be seen that gender, age as well as income and cost of living play a very important role in various aspects that shape the quality of life of patients.

Starting the attempt to interpret the findings from the greater percentage of male patients, it is found that this finding has been shown by a number of studies apart from the present one.[13,14] Of course, it is worth mentioning that some studies have shown little or no difference in terms of prevalence on both genders.[15] This particular finding can be interpreted both on the basis of environmental/behavioral factors, such as for example the dietary choices of both sexes and the frequency of checks, and additionally on the basis of biological differences, such as the tendency to accumulate visceral fat in men is in a greater percentage, compared to women, on average.[15] Subsequently, through the analysis of the questionnaires, a particularly high cost of living due to the illness was highlighted, especially in relation to the income of the patients, which is also confirmed by other researches and is an extremely important factor.[16] Although, out of all the patients who had gotten requested to participate, pretty much all of them did and according to the answers they gave, it insured that the costs rose significantly due to the movements, but also due to the absence from work, for both themselves and their carers. This fact, as well as the fact that there was a highly significant disparity between the highest and lowest costs, highlights significant inequalities in healthcare access, as well as an exhausting cost, which explains why the issue of financial management was found to influence so significantly the patients' quality of life.

Additionally, both gender and age were shown to play an important role in the quality of life indicators, both in relation to the physical and mental health of the patients. Men, as well as younger patients, showed a higher quality of life, a finding that has also been highlighted by other research in this field. Indicatively, differences in the impact of colon cancer between men and women have been highlighted by the research of Kim et al.[17]Accordingly, in agreement with the findings of the current research, the research of Laghousi et al.,[18] also concluded that women are more susceptible to reduced physical and social functioning after the onset of cancer and report higher levels of fatigue and distress compared to men. However, research by Lepore et al. has shown that the differences in quality of life are not statistically significant between the two sexes.[19] In an attempt to interpret the specific finding in the present re-

search, i.e. the prominent role of gender, it is worth emphasizing the extremely high prevalence of men in the sample, which may have affected the results.

Moving on to the factor of age, which seems to have influenced many indicators of quality of life, related to the mental and physical health of patients, with younger age being associated with more improved indicators, this finding seems to be the most frequent one that has emerged from several researches,[20-23] since younger age usually implies a higher quality of life even in the entire population,[24,25] due to the burden on physical and mental health[26] and the decrease in functionality and vitality[27] over the years. Of course, it is worth mentioning that there are also studies which have shown contrary findings.[28]

Finally, an interesting finding, which has not been identified in other surveys, concerns the place of residence, with those residing permanently in Attica showing more positive results in several quality of life indicators. This finding can possibly be satisfactorily interpreted by the assumption that living in the capital implies easier access to care, without the need for commuting and absence from work, which contributes to the cost of treatment, a negative factor for quality of life .

Concluding with a particularly important finding, the generally reduced quality of life of patients with bowel cancer, which has been highlighted by other, similar studies [29], this can be interpreted in relation to the patients' increased anxiety, pain, as well as the significant financial burden they face.

Strengths and Limitations

The present research had some strengths and limitations. The fact that the questionnaire was distributed in person by the first author who was available for explanations and clarifications, increases the reliability and therefore the strength of our survey.

The first limitation of our study was the small sample size which possibly influenced the results obtained. The second limitation was that the sample was drawn from a single hospital. Other limitations are: Lack of randomization, heterogeneity of the sample, and the possible stoma affecting the QoL to a great extent. That is why the generalization of the findings is restricted to a national level.

CONCLUSION

The generally reduced quality of life of patients with colon cancer, can be interpreted in relation to the increased anxiety of patients, pain, as well as the significant financial burden they face.

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ANNEX

TABLE 1. Baseline Sociodemographic Characteristics (N=170)

Baseline characteristics	Mean (±S.D.)*	n (%)
Gender		
Men		116 (60.4)
Women		76 (39.6)
Residence		
Out of Attica		35 (22)
Attica		154 (84.6)
Marital status		
Singles		15 (7.8)
Married		131 (68.2)
Divorced		12 (6.3)
Widowers		34 (17.7)
Number of children		
0		22 (11.6)
1		43 (22.6)
2		90 (47.4)
3		28 (14.7)
4		4 (2.1)
5		3 (1.6)
Number of people living together		
0		0
1		35 (18.2)
2		81 (42.2)
3		48 (25)
>3		21 (10.9)
4		7 (3.6)
Educational level		
Illeterate		5 (2.6)
Primary School graduate		50 (26)
Junior high school graduate		28 (14.6)
High school graduate		48 (25)
Institute of Vocational Training graduate		26 (13.5)
Technological institure graduate		29 (15.1)
MSc/PhD		6 (3.1)
Age	66.7± 10	
*S.D.: Standard Deviation		

TABLE 2. Occupational characteristics of the patients. (N=170)

Characteristics	n	%
Employment		
Complete	24	12.5
Partial	4	2.1
Unemployed	23	12
Pensioners	141	73.4
Working hours per week		
≤40	17	73.9
>40	6	26.1
Work area		
Public	10	35.7
Private	18	64.3
Insurance coverage		
Ika	124	64.6
Public	51	26.6
TEVE	8	4.2
Other	9	4.6
Monthly family income (€)		
0-500	40	20.8
501-1000	85	44.3
1001-1500	50	26.0
1501-2000	11	5.7
2001-2500	4	2.1
2501-3000	2	1
Days of the patient's absence from work during the previous semester[α]	100	79
Days of absence of family members from work during the previous semester[α]	20	24

[α]S.D.: Standard Deviation

TABLE 3. Patients' Cost of living (€) due to the disease during the previous semester.

Cost (€)	Mean value	Standard deviation	Median value	Interquartile range	Minimum value	Maximum value
Medical visits	239	186	200	160	0	1200
Nurse visits	25	304	0	0	0	4200
Physiotherapy	81	165	0	0	0	1000
Psychologist visits	63	226	0	0	80	2000
Social worker visits	0	0	0	0	0	0
Buying medication	254	289	180	153	0	2500
Purchase of special pharmaceutical material	63	180	0	45	0	1800
Carer services	103	300	0	70	0	2000
Gym visits	3	43	0	0	0	600
Cosmetics purchases	5	37	0	0	0	300
Mobilization due to the condition	436	552	250	215	0	5000
Visiting friends	22	22	20	30	0	100
Phone calls	0,4	4	0	0	0	50
Expenses of another illness	163	155	150	240	0	1000
Hospitalization	17	156	0	0	0	2000
Special diet or nutritional supplements	367	393	300	600	0	3000
Conversion at home	26	140	0	0	0	1000
Other expenses (due to the condition)	735	2046	300	350	0	17.000
Due to absence from work	2282	2457	1200	4000	0	8000
Due to absence of family members from work	509	608	375	738	0	3000
Total cost	3714	2818	2995	2932	110	19.515

TABLE 4. Number of uses of health services by patients during the previous semester.

	Mean value	Standard deviation	Median value	Interquartile range	Minimum value	Maximum value
Medical visits	3	2.8	2	2	0	20
Nurse visits	0.1	0.5	0	0	0	7
Physiotherapy	3.1	6.5	0	0	0	40
Psychologist visits	1	4.8	0	1	0	50
Social worker visits	0.3	0.6	0	0	0	3
Buying medication	6.8	14.5	6	0	0	200
Purchase of special pharmaceutical material	1.3	5.5	0	1	0	60
Carer services	1.7	5.2	0	1	0	40
Gym visits	0.1	0.9	0	0	0	12
Cosmetics purchases	0.1	0.6	0	0	0	6
Mobilization due to the condition	10.7	5.6	12	3	0	36
Visiting friends	1.2	1.2	1	2	0	5
Phone calls	0.1	0.7	0	0	0	10
Expenses of another illness	0.9	1.1	1	1	0	6

TABLE 5. Cronbach's alpha internal consistency coefficients for the SF-36 scales.

Scales	Cronbach's alpha
Physical functionality	0.92
Physical role	0.72
Physical pain	0.73
General health	0.86
Vitality	0.88
Social functionality	0.86
Emotional role	0.84
Mental health	0.81
Summary scale of physical health	0.81
Brief Mental Health Scale	0.89

TABLE 6. Descriptive results for the SF-36 scales.

Scale	Mean value	Standard deviation	Median value	Interquartile range	Minimum value	Maximum value
Physical functionality	36.6	24.4	32.5	40	0	100
Physical role	36.6	22.5	25	18.8	25	100
Physical pain	60.9	29.7	62	59	0	100
General health	28.2	14.2	27	15	0	97
Vitality	41.1	21.6	43.8	36	0	87.5
Social functionality	24.5	25.1	12.5	42.5	0	92.5
Emotional role	41.3	26.3	25	25	25	100
Mental health	51.3	16.4	50	23.8	5	95
Summary scale of physical health	34.2	7.6	33.4	10.8	15.7	53.4
Brief Mental Health Scale	36.4	7.7	35.6	9.9	18.6	61.3

TABLE 7. Multivariate linear regression analysis

	Factor b	95% Confidence Interval for b	p-value
Dependent variable: mental health			
Independent variable			
Monthly family income	1.5	0.3 - 2.8	0.016
Number of people living together	1.4	0.2 - 2.6	0.027
Total cost of living	-0.0003	-0.001 - -0.00001	0.043
Dependent variable: physical functioning			
Independent variable			
Monthly family income	2.8	0.1 - 5.5	0.04
Dependent variable: physical role			
Independent variable			
Men vs. Women	12.5	6.7 - 18.3	<0.001
Age	-0.6	-0.9 - -0.4	<0.001
Total cost of living	-0.002	-0.003 - -0.001	<0.001
Dependent variable: general health			
Independent variable			
Age	-0.2	-0.4 - -0.002	0.047
Dependent variable: social role			
Independent variable			
Men vs. Women	15.2	8.3 - 22.1	<0.001
Age	-0.7	-1.1 - -0.3	<0.001
Monthly family income	4.4	1.2 - 7.6	0.007
Total cost of living	-0.003	-0.004 - -0.002	<0.001
Residence in Attica	9.6	0.3 - 18.9	0.044
Dependent variable: emotional role			
Independent variable			
Men vs. Women	13.1	5.9 - 20.2	<0.001
Age	-0.5	-0.9 - -0.1	0.013
Employees	13.1	2.1 - 23.9	0.019
Total cost of living	-0.002	-0.003 - -0.001	0.001
Dependent variable: mental health			
Independent variable			
Age	-0.3	-0.5 - -0.06	0.013
Monthly family income	3.4	1.1 - 5.8	0.004
Total cost of living	-0.001	-0.002 - -0.0003	0.004
Residence in Attica	7.9	1.7 - 14.0	0.012