Relationship of Knowledge, Attitude, Practice (KAP) and Demographic Factors with Quality of Life among Urban Colorectal Cancer Patients in Malaysia

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Abstract

Background: There is an increasing incidence of colorectal cancer in Malaysia. The aim of this study is to evaluate sociodemographic data, knowledge, awareness, practice level, and quality of life in colorectal cancer patients.

Methods: A cross-sectional study was conducted from December 2011 to June 2012 that involved 105 patients diagnosed with colorectal cancer at four chosen tertiary government hospitals. The European Organization for Research and Treatment of Cancer questionnaire was used to measure quality of life and consisted of global health status, five functional scales, six single items and three symptoms scores. A novel knowledge, awareness and practice questionnaire toward colorectal cancer contained three sections of 36 closed-ended questions on knowledge, and ten questions on awareness and practice.

Results: The mean age of the respondents was 58.30±12.64 years. Most respondents were diagnosed with Dukes' D (46.7%) stage. Patients' age showed significant association (Spearman Correlation test) with emotional (*P*=0.048) and social functioning (*P*=0.036). Indians showed significant association with global health status (*P*=0.007), emotional functioning (*P*=0.039) and pain (*P*=0.009). There was a significant association between females with nausea and vomiting (*P*=0.015) and lower household income with diarrhea (*P*=0.042). Cancer stage showed the most significant association with patients' quality of life with cognitive functioning (*P*=0.030), social functioning (*P*=0.006), pain (*P*=0.044) and financial impact (*P*=0.047). Although the mean scores for knowledge (24.53±2.36), awareness (29.72±2.09) and practice (24.05±3.65)were high, they were not associated with quality of life.

Conclusion: Our research showed that patients with advanced age and disease have lower quality of life. Raising awareness by educating the public and implementing a nationwide screening program would allow early detection and treatment of colorectal cancer, thus avoiding deterioration of quality of life.

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Introduction

Colorectal cancer (CRC) begins in the large intestine (colon) or the rectum (end of the colon). The most common symptoms of CRC are bleeding per rectum, abdominal pain, and change in bowel habits; the majority have anemia and occult bleeding. For proximal tumors, CRC is usually associated with anorexia, nausea, vomiting, abdominal pain, or fatigue. For distal tumors, it is usually associated with bleeding per rectum and constipation. The most common signs are bleeding per rectum, rectal abnormalities and tenderness upon abdominal palpation. Other signs of CRC are pallor (indicating anemia) and palpation of an abdominal mass.[1]

Traditionally, since 1932 CRC have been staged according to Dukes' Classification. Subsequently, the staging underwent Astler-Coller modification in 1954[2] which was followed by TNM Staging of Colorectal Carcinoma based on the American Joint Committee on Cancer (AJCC) in 1977.[3] The staging was last updated in 2010. For the relationship between socio-demographics and incidence of CRC in terms of race, according to the National Cancer Registry (NCR) in 2006,[4] the Chinese have shown a significant association with CRC with a reported incidence of 21.4 per 100,000 population. The lowest incidence per 100,000 population was observed among Indians (11.3) and the Malay (9.5). There have been no specific studies done on the incidence of CRC in Malaysia in relationship with religion. However, a study in Australia has shown that Hinduism and Buddhism have a lower risk of acquiring CRC.[5] For age, this condition is more prevalent among the elderly.[6] Based on NCR 2006,[4] there was slightly higher incidence of CRC reported among males (21.6 per 100,000) compared to females (15.4 per 100,000). There were no specific studies done on the incidence of CRC in Malaysia in relationship with education level. However, a study in the US showed that people with higher education levels had lower incidence of CRC.[7] Another US study which involved all forms of cancer showed the highest incidence of cancer in people with 12 years of education (completed high school but did not pursue tertiary education), followed by 0-11 years of education (did not complete high school) and >13 years of education (tertiary education).[8]

There are four core domains of quality of life (QOL): physical, social, occupational/functional, and psychological/spiritual well being. However, various other external factors such as culture, environment, education level and demographics should be considered in assessing QOL.[9] The importance of QOL in the health care field is clearly recognized according to the definition of health by the World Health Organization (WHO) in 1946,[10] which has defined health as 'not only an absence of disease but also a state of complete physical, mental and social wellbeing'. The current medical practice has evolved greatly whereby the health care system no longer focuses merely on patient survival and mortality but also emphasizes a more holistic approach of morbidity, psychosocial function, social support, health status, comfort and economic factors.[11] Assessment of QOL in CRC patients has becoming increasingly important as its incidence rate is rising in the Malaysian population. Clearly, the diagnosis of cancer or CRC for that matter can cause an inconsiderable amount of grief to patients and their families. Additionally, physiological stress from the disease symptoms and cancer treatment can also significantly affect a patient's QOL.[12]

Numerous knowledge, awareness and practice (KAP) studies have been conducted in relation to CRC screening. An Iranian study in 2004 showed that knowledge of CRC symptoms was poor and reflected in the percentage of late stage and emergency presentations. Increased public awareness of CRC might lead to earlier presentation and improved survival.[13] Other studies in Iran have shown that the general population's knowledge about CRC is an important factor that affects the at-risk population's screening beliefs and behavior. Increased knowledge about CRC and screening encourages people to undergo screening tests.[14] Although there is no study in Malaysia that considers total government expenditure on cancer management, a relatable

study from Australia, which has a comparable population and cancer burden (although it is a wealthier nation), has shown that anti-neoplastic drugs ranked seventh by cost in its top ten therapeutic groups. Anti-neoplastic drugs alone cost the Australian taxpayer at least RM600 million annually.[15]

Materials and Methods

This was a cross-sectional study conducted in four tertiary government hospitals. The participants were patients diagnosed with CRC at Universiti Kebangsaan Malaysia Medical Centre (UKMMC), Kuala Lumpur General Hospital (GHKL), Selayang General Hospital and Hospital Tuanku Jaafar, Seremban, each chosen according to universal sampling. A total of 105 patients participated in this study. We used an interviewer-guided questionnaire which evaluated socio-demographic data, QOL of patients with CRC, and KAP. The patients' interviews were based on a patient micro-costing form. The European Organization for Research and Treatment of Cancer questionnaire [EORTC Quality of Life Questionnaire (QLQ-C30, version 3.0)] was used to evaluate the QOL of CRC patients and incorporated all functional domains and symptoms. Approval from the Ministry of Health Malaysia was obtained under the code of NMRR-11-375-8329.

Patient's QOL was measured via the EORTC QLQ-C30. Quality of life was divided into four main groups. The first aspect was the global health status of the patient. The second group consisted of the following functional status: physical functioning, emotional functioning, role functioning, cognitive functioning and social functioning. The third group, the symptoms scale, consisted of three symptoms: fatigue, nausea and vomiting, and pain. The fourth group was the group of single items that contained six single items: dyspnea, insomnia, loss of appetite, constipation, diarrhea and financial impact.

Knowledge, awareness and practice levels were measured using a validated interviewer-guided questionnaire prepared by the researchers of this study. This questionnaire contained three sections wherein scores for each section were based on a Likert scale. Section A contained 36 closed-ended questions on knowledge with a score range of 0 to 36. Section B contained 10 questions with a scale on awareness with scores from 0 to 4 per question and a total score of 40. Section C contained 9 questions with a scale on practice with scores from 0 to 4 per question and a total score of 36. All answers were based on respondents' own understanding of the questions. Consent was taken from all the patients who participated in this study and permission obtained from the Head of the Surgical Department and Head of the Oncology Department of the respective hospitals before administering the questionnaires to identified respondents. The results were interpreted using SPSS version 16.0.

Results

Descriptive statistics and univariate analysis
Sociodemographic data
Age

In this study, the age distribution was normal. The mean age of our participants was determined to be 58.30±12.64 years, with ages that ranged from 19 to 87 years of age.

Ethnicity

Global health status (P=0.007), emotional functioning (P=0.039) and pain symptom (P=0.009) by ethnicity were significant. Indians had highest score for global health status and emotional functioning, as well as the lowest severity score for pain. Malays were associated with moderate scores for global health status and emotional functioning, but suffered the most severely from pain, whereas the Chinese were associated with the lowest scores for global health status and emotional functioning, but fared moderately for pain (Table 4).

Gender

The majority of respondents were of the male gender (59.0%), compared to females (41.0%). This reflected the preponderance of CRC in the male gender.

Level of education

The majority of respondents completed a secondary school level of education (48.6%) followed by primary school level (33.3%), tertiary level (10.5%) and lastly, never attended school (7.6%). Based on the results, most patients that sought medical attention in government hospitals were secondary school leavers. This indirectly showed that patients of a higher education level, graduates and higher who had better incomes sought medical assistance from the private sector.

Total household income

Based on the descriptive analysis of total household income of patients, the findings showed that the data was not normally distributed. The median total household income per month was RM2000.33 with an inter-quartile range of RM2500.00. From this result, we see that most patients that presented to government hospitals had a median value of total household income per month of RM2000.33. This explained why our respondents were mostly Malays because the Chinese median monthly income in 2007 was RM4853.00; they were prone to seek treatment at private hospitals.

Cancer stage

Staging from an overall general perspective showed that the highest number of respondents came from the Dukes' D stage cancers (46.7%), followed by Dukes' C (44.8%) and Dukes' B (8.5%). None of the respondents had Dukes' A stage cancer. This has indirectly shown the current condition in our country which lacks a national screening program. Hence, the cases which came for medical attention will be stage Dukes' C and D who usually present with signs and symptoms of CRC.

Patient's knowledge, awareness and practice levels (KAP)

The data for KAP were normally distributed. The results revealed that knowledge had a mean of 24.53±2.36, awareness had a mean of 29.72±2.09 and the mean practice score was 24.05±3.65. The descriptive characteristics of

CRC patients are summarized in Table 1.

Quality of life (QOL)

Each patient's QOL was measured via the EORTC QLQ-C30which was divided into four main groups. The first aspect was the global health status of the patient. The second group comprised five functional status: physical, emotional, role, cognitive and social. The third group was the symptoms scale that consisted of fatigue, nausea and vomiting, and pain while the fourth group was the group of single items which was comprised of six single items: dyspnea, insomnia, loss of appetite, constipation, diarrhea and financial impact. Table 2 shows the result of patients' QOL.

Global health status

The data for the global health status was not normally distributed. The median value for the global health status was 83.33 with an inter-quartile range of 25.00 (Table 2).

Functional status

The data for all five components in the functional status were not normally distributed. The median value for physical functioning was 93.33 with an inter-quartile range of 13.33. Role, cognitive and social functioning recorded the same median value of 100.00. The inter-quartile range for role functioning was 16.67 whereas both cognitive and social functioning had an inter-quartile range of 0.00. Lastly, emotional functioning recorded a median value of 91.67 with an inter-quartile range of 16.67 (Table 2).

Symptoms Scale

The symptoms scale consisted of three symptoms: fatigue, pain and nausea, and vomiting. The data for this scale was not normally distributed. The median value for all three symptoms was 0.00. However, the inter-quartile range value was 22.22 for fatigue, 0.00 for nausea and vomiting, and 16.67 for pain (Table 2).

Single items

Analysis was carried out on the six items of dyspnea, insomnia, loss of appetite, constipation,

Table 1. Descriptive characteristics of CRC patients (n=105).

		Mean	SD	Frequency	Percent
Age (years old)		58.30	12.6		
Race	Malay			64	61.0
	Chinese			24	22.8
	Indian			16	15.2
	Others			1	1.0
Gender	Male			62	59.0
	Female			43	41.0
Level of Education	Never schooled			8	7.6
	Primary school			35	33.3
	Secondary school			51	48.6
	Tertiary– University			11	10.5
Total household income (RM)		Median = 2000.33	IQR = 2500.00		
Cancer Stage	Dukes' A			0	0.0
	Dukes' B			9	8.5
	Dukes' C			47	44.8
	Dukes' D			49	46.7
Patient's KAP	Knowledge	24.53	2.36		
	Awareness	29.72	2.09		
	Practice	24.05	3.65		

*RM: Malaysian Ringgit

diarrhea and financial impact. The data were not normally distributed. All items had a median value of 0.00. The inter-quartile range for insomnia, loss of appetite and financial impact was 33.33, whereas the inter-quartile range value for dyspnea, constipation and diarrhea was 0.00 (Table 2).

Bivariate analysis of quality of life (QOL)

Age

There was no association between age and QOL with the exception of patient's emotional (P=0.048) and social (P=0.036) functioning with positive correlations of r=0.193 and r=0.205, respectively (Table 5). This suggested that older CRC patients had better QOL in terms of emotional and social functioning.

Race

Global health status (P=0.007), emotional functioning (P=0.039) and pain symptom (P=0.009) by race were significant. Indians had highest score for global health status and emotional functioning, as well as the lowest severity score for pain. Malays were associated with moderate scores for global health status and emotional functioning, but suffered the most severely from pain, whereas the Chinese were associated with the lowest scores for global health status and emotional functioning, but fared moderately for pain (Table 4).

Gender

For global health status, females scored higher compared to males, but this was not statistically significant (P=0.961). There was no association between functional status and single items with gender. However, there was an association between gender and nausea and vomiting, in which females suffered more from nausea and vomiting (P=0.015; Table 3).

Level of education

Patients with tertiary education had the highest mean ranks for global health status and emotional functioning while patients with primary school education had the highest mean ranks for physical, role, cognitive and social functioning. Those who never attended school had the highest scores for each of the symptom scales. For single items, patients who never attended school had the highest

Table 2. Patient's quality of life (n=105).

Patient's quality of life (QOL) (score)		Median	IQR
Global health status		83.33	25.00
Functional status	Physical functioning	93.33	13.33
	Emotional functioning	91.67	16.67
	Role functioning	100.00	16.67
	Cognitive functioning	100.00	0.00
	Social functioning	100.00	0.00
Symptoms scale	Fatigue	0.00	22.22
	Nausea/Vomiting	0.00	0.00
	Pain	0.00	16.67
Single items	Dyspnoea	0.00	0.00
	Insomnia	0.00	33.33
	Loss of appetite	0.00	33.33
	Constipation	0.00	0.00
	Diarrhoea	0.00	0.00
	Financial Impact	0.00	33.33

mean ranks for insomnia, loss of appetite, diarrhea and financial impact whereas those with secondary school education had the highest scores for dyspnea. Patients with primary school education had the highest mean score for constipation. However, there was no association between level of education and all of the QOL domains.

Total household income

There were no associations observed between household income and all QOL components with the exception of diarrhea in the single items part. There was a significant association between household income and diarrhea at *P*=0.042. Diarrhea symptoms were experienced by patients who had lower total household incomes.

Cancer stage

Global health status by disease severity showed that score values were highest for Dukes' B, followed by C and D stages. There was better global health status in the early stages of CRC. However, these differences were not significant for all stages (*P*=0.226). The highest score values were from stage Dukes' B CRC for physical, role, emotional, cognitive and social functioning. This showed that the early stage of CRC had better functional status. The lower scores were among stage D cancer for all functional status except for role functioning. These differences in score values

were significant for cognitive (*P*=0.030) and social (*P*=0.006) functioning. However, physical, role and emotional functioning results were not significant. For the symptoms scale, Dukes' D score had the highest values for all three symptoms which indicated that advanced stage CRC experienced more symptoms. These differences in score values were significant only for pain symptoms (*P*=0.044). Single items were not significant for all cancer stages, except for financial impact which was significantly associated with cancer stage (*P*=0.047). We believed that the advanced cancer stage would require more cost for treatment compared to the early stage (Table 6).

Patient knowledge

We used the Spearman correlation test to analyze the association between global health status and patient knowledge. The correlation coefficient value was 0.007, which resulted in a *P*-value of 0.942 which was not significant. The correlation coefficient value for emotional functioning was 0.157 and for cognitive functioning was 0.071, both of which positively correlated with the patient's knowledge score. The *P*-value was 0.111 for emotional functioning and 0.469 for cognitive functioning. The remaining components were negatively correlated with the patient's knowledge score. The coefficient

correlation values were -0.038 for physical functioning, -0.083 for role functioning and -0.037 for social functioning with *P*-values of 0.697 (physical functioning), 0.400 (role functioning) and 0.705 (social functioning). The *P*-values were greater than 0.05 which showed no significant association between the patient's knowledge score and their functional status.

Upon analyzing the correlation between patient's knowledge and symptoms scale, we noted a negative correlation between patient knowledge and fatigue (*P* = -0.103), which was not statistically significant (*P*=0.295). For nausea and vomiting, the correlation coefficient value was 0.053 with a *P*-value of 0.595. There was a negative correlation in the association between patient's knowledge and pain with a correlation coefficient value of -0.082 and *P*-value of 0.404. Hence, there was no association between patient knowledge and the symptoms scale.

Analysis of the association between patient's level of knowledge and single items revealed that all correlations were negatively associated. The correlation coefficient was -0.069 for dyspnea, -0.014 for insomnia, -0.100 for loss of appetite, -0.037 for constipation, -0.080 for diarrhea and -0.040 for financial impact. There were no associations between patient's level of knowledge and single items. The *P*-values were 0.486 (dyspnea), 0.888 (insomnia), 0.311 (loss of appetite), 0.710 (constipation), 0.416 (diarrhea) and 0.685 (financial impact).

Patient awareness

We used the Spearman correlation test to analyze the association between global health status and patient awareness. The correlation coefficient value was 0.037, which resulted in an insignificant *P*-value of 0.705. Thus, there was no association between patient's awareness and global health status. There was a negative correlation in terms of physical and emotional functioning and the patients' awareness scores. The correlation coefficient values were -0.082 (physical functioning) and -0.047 (emotional functioning) which gave *P*-values of 0.407 (physical functioning) and 0.634 (emotional functioning). The correlation coefficients for the remaining

Table 3. Patient's quality of life by gender (n=105).

		Wilcoxon Rank Sum		
Gender	n	Nausea/Vomiting		
		Mean Rank	Z	P
Male	62	48.61	-2.428	0.015*
Female	43	59.33		

*significant at *P*<0.05

items were 0.095 (role functioning), 0.018 (cognitive functioning) and 0.047(social functioning). The *P*-values for these three components were 0.333 (role functioning), 0.855 (cognitive functioning) and 0.638 (social functioning), which showed no significant association between patients' awareness scores and functional status.

There was a positive correlation between patients' awareness scores and the symptoms scale. The coefficient correlation value was 0.052 for fatigue, 0.001 for nausea and vomiting, and 0.098 for pain with *P*-values of 0.600 (fatigue), 0.993 (nausea and vomiting) and 0.320 (pain), which were not significantly associated with the symptoms scale. There were negative correlations between patients' awareness scores with diarrhea and financial impact. The correlation coefficient value was -0.111 for diarrhea and -0.023 for financial impact with *P*-values of 0.259 (diarrhea) and 0.819 (financial impact) which did not show any significant associations. The correlation coefficients were 0.064 for dyspnea, 0.084 for insomnia, 0.118 for loss of appetite and 0.094 for constipation. There was no significant association between the patients' awareness scores and the above mentioned items.

Patient's practice

In analyzing the association between global health status and the patients practice scores, we used the Spearman correlation test. The correlation coefficient value was 0.010 which gave a *P*-value of 0.921 which was insignificant. Therefore there was no association between the patient's practice and their global health status. All components in the functional status with the exception of emotional functioning were positively correlated with the patient's practice score. The correlation

Table 4. Patient's quality of life by race (n=105).

Race	Global Health Status					Emotional Functioning					Pain				
	n	Median	Mean Rank	KW	P	n	Median	Mean Rank	KW	P	n	Median	Mean Rank	KW	P
Malay	64	37	49.08			64	36	51.30			64	28	59.04		
Chinese	24	14	47.77			24	17	45.17			24	13	50.67		
				12.165	0.007*				8.395	0.039*				11.680	0.009*
Indian	16	2	74.75			26	5	69.72			16	14	33.88		
Others	1	0	81.50			1	0	82.00			1	1	28.50		

*significant at P<0.05; *KW=Kruskal-Wallis

coefficient value was 0.010 for physical functioning, 0.059 for role functioning, 0.174 for cognitive functioning and 0.070 for social functioning. The corresponding *P*-values were 0.921 (physical functioning), 0.549 (role functioning), 0.076 (cognitive functioning) and 0.476 (social functioning). The correlation between practice score and emotional functioning was -0.084 which gave a *P*-value of 0.394.

There was no significant association between the patient's score of practice and all components in the patient's functional status. The correlation between the patient's score of practice and the symptoms scale were all negative. The correlation coefficient values were -0.053 for fatigue, -0.153 for nausea and vomiting, and -0.112 for pain with *P*-values of 0.590 (fatigue), 0.120 (nausea and vomiting) and 0.254 (pain). Hence, there was no significant association between the patient's score of practice and the symptoms scale.

Analysis of the association between patient's score of practice and the single items revealed that 5 out of 6 of the correlation coefficients were negative, as follows: -0.114 (dyspnea), -0.154 (insomnia), -0.079 (loss of appetite), -0.190 (diarrhea) and -0.096 (financial impact). All items however, had *P*-values greater than 0.05 which showed no association between patients' scores of practice and the single items mentioned above. As for constipation, there was a positive correlation with the patients' scores of practice (0.119). The *P*-value was 0.228 which showed no significant association between patients' scores of practice and constipation.

Discussion

Despite the lack of a statistical association between age and pain (*P*=0.060) or any association between KAP and QOL, we believe that further research with a larger sample size can be performed to explore this aspect and its effect on patient QOL in view of the literature that has supported these positive associations. In addition, through our research, we found associations between age, household income, disease severity, race and gender with varying aspects of QOL. With such associations, we would recommend medical practitioners give more focus on the identification of such factors among patients that could affect their QOL. If such factors were present, these patients should be given more attention and care since their QOL would be lower compared to patients who lack these factors.

Another issue to be considered is screening for CRC. The rising trend in incidence of CRC in Malaysia indicates the need for early detection as the majority of our patients present at a later disease stage. CRC cure is possible if patients are diagnosed at an early stage. Screening not only helps in early diagnosis but also can help in reducing the treatment cost that is borne by the patient and, in the long run, improves patients' QOL. Therefore, we propose a national screening program among Malaysian citizens in order to detect this disease at its early stages. There are two types of screening for CRC, the fecal occult blood test and colonoscopy. Studies have indicated that early screening demonstrates significant reductions in mortality.[16] However before implementing any national screening policy, the cost effectiveness of the program should be assessed as there are various screening tools available that include both invasive and noninvasive tests. Limited access to healthcare facilities in rural areas will also

Table 5. Patient's quality of life by age and household income.

QOL			Spearman Correlation	
			ρ	P
Age (years old)	Functional Status	Emotional Functioning	0.193	0.048*
		Social Functioning	0.205	0.036*
Household Income (RM)	Signs and Symptoms	Diarrhoea	-0.199	0.042*

*significant P<0.05

pose a problem when providing wider coverage of the screening program.

Unfortunately, this study has shown that the Asian public awareness towards CRC is low, with only 3% of individuals expressing awareness that CRC is a fatal disease.[6] The lack of public awareness can be overcome through public education via various national health programs. The roles of primary care physicians are vital in identifying the high risk individual and referring them for appropriate screening.

Conclusion

Upon completing this study, a number of factors were significantly proven to be associated with the QOL of patients with CRC. Age and race of the patients were factors significantly associated with the functional status of patients, whereas gender and staging of CRC were significantly associated with the certain symptoms scale and the single items. However, level of KAP of patients with regards to CRC did not show any significant association with any of the components of the patients' QOL. Although the

KAP scores attained by the patients in this study were good (mean score for knowledge: 24.53±2.36; awareness: 29.72±2.09; and practice: 24.05±3.65), these did not appear to affect patients' QOL. This contrasted with most studies conducted worldwide where the majority showed associations between KAP and QOL in CRC or other types of cancers.

Conflict of Interest

The authors wish to express that they have no conflict of interest.

Table 6. Patient's quality of life by cancer stage

Stage	Cognitive Functioning					Social Functioning				
	n	Median	Mean Rank	KW	P	n	Median	Mean Rank	KW	P
Dukes' B	8	8	67.00	7.044	0.030*	8	8	63.00		
Dukes' C	47	47	56.37			47	47	57.90	10.281	0.006*
Dukes' D	49	49	47.64			49	49	45.60		

*significant at P<0.05

Stage	Pain					Financial Impact				
	n	Median	Mean Rank	KW	P	n	Median	Mean Rank	KW	P
Dukes' B	8	7	33.31	6.228	0.044*	8	7	39.31		
Dukes' C	47	26	50.07			47	32	48.10	6.108	0.047*
Dukes' D	49	22	57.96			49	23	58.88		

*significant at P<0.05 *KW=Kruskal-Wallis

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