Pilot Study of Feasibility to Reduce Lead Times in Colorectal Cancer Treatment in a Moroccan Cancer Center: A Convergent Mixed Method Study

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Abstract

Background: Short lead time in colorectal cancer treatment is important to improve patient outcomes. This study aimed to explore factors associated with longer lead times between the first consultation and the therapeutic decision, and between the first consultation and the treatment initiation.

Results: 83 patients were included in the quantitative analysis. The median T1 duration was 16.53 days, a delay statistically associated with younger age, low-income patients, rectal cancer, and radiotherapy as first treatment. The median T2 duration was 45.36 days. Basic medical insurance and rectal cancer were statistically associated with these delays. In-depth interviews confirmed the impact of the type of medical coverage on the lengthening of the delays. Radiotherapy and the occasional unavailability of equipment were also noted. The objectives set to decrease the two waiting times would be achievable through increased coordination between the different stakeholders and optimization of the care procedures all along, with an effective and efficient hospital supply chain enhanced by a digital orientation.

Conclusion: In this pilot study performed in a low-mid income country, the main reasons for delays in the treatment of colorectal cancer were the patient's low socio-economic level and rectal cancer. Increasing coordination and adapted procedures may improve these results.

Background

Cancer is a major public health problem around the world and is the second leading cause of death after cardiovascular disease. Forecasts indicate a significant increase in the incidence of cancer in the future [1]. All countries should prepare their respective health systems to anticipate methods to manage this burden that several studies have shown to be more accentuated in countries of low and middle socioeconomic level [1].

Morocco, as a low-middle-income country (LMIC) is also experiencing a significant increase in the incidence of cancer. According to the Globoccan registry, the number of cases per year in Morocco increased from 35,000 new cases in 2012 to over 52,000 new cases in 2018 [2] (Globoccan, May 16th, 2020). Most patients are diagnosed with late stages, for which the curative strategies are less effective [3]. Early diagnosis and reduction of the time between diagnosis and treatment initiation are necessary to improve the prognosis and the overall experience of cancer patients.

Colorectal cancer is the first digestive cancer in the world [2, 4, 5]. In the early stages, the curative treatment is multidisciplinary, including mainly surgery, associated if necessary with chemotherapy and/or radiotherapy [6, 7]. Several recommendations have been issued regarding the time to be respected between diagnosis and the start of treatment for colorectal cancer [8–10]. In Canada, it is recommended not to exceed 15 days between carrying out diagnostic assessments and surgery [11]. In Great Britain, a period of 15 days between referral by the general practitioner and arrival to a specialist is recommended [12]. In Morocco, as in other LMIC countries, there are no specific recommendations on the subject, and treatment is often initiated late after diagnosis [13]. The current situation in Morocco indicates that there

are several problems related to access to hospital services, including for cancer diseases - especially for low-income patients who represent the majority of public hospitals' inpatients and outpatients [14]. These patients have basic state medical insurance (called RAMED), created for poor populations covering basic and chronic diseases such as cancer. Reducing the waiting times is important to improve the quality of care and in-fine improve hospital services. In addition to this, reducing the waiting times may have a positive impact to reduce not only high health-related expenditures that are mainly linked to the lack of health coverage, but also indirect costs such as out-of-pocket expenditures that patients have to bear. Previous studies have demonstrated the heavy economic burden for patients and their respective families. In fact, the out-of-pocket expenditures represent 50.7% of the total health expenses, related mostly to services that are purchased from the private sector because of their unavailability in the hospital, or in order to reduce the waiting time.

Morocco undertook many hospital reform projects between 2001 and 2012 with an aim to improve the quality of care. In this sense, tools related to organizing the care path within hospitals were central issues that were combined with introducing quality management tools. From a bottom-up perspective, a project with an objective to reduce waiting times for colorectal cancer patients has been set up at the National Institute of Oncology in Rabat, Morocco (NIO). This project was carried out by a multidisciplinary team from the NIO, and it recommended respecting a period less than 15 days between the first consultation at the hospital and the therapeutic decision-making in a multidisciplinary team meeting (MDT), and 30 days between the first consultation and the treatment initiation. Previous reports showed that most patients coming from remote areas have to wait more than the above-mentioned periods.

The aim of the study

The aim of this study was to evaluate both quantitatively and qualitatively the impact of the implementation of a program aiming to reduce the waiting times between first visit and MDT to 15 days and between the first visit and treatment to 30 days for colorectal cancer patients in an academic public cancer center in Morocco (North Africa).

Methods

Context

The National Institute of Oncology (NIO) is an academic public cancer center that was created in 1985 in order to treat adult patients with solid cancers. It contains all specialties required for multidisciplinary management of solid cancers such as chemotherapy, radiotherapy, surgery, pathology, radiology, genetics, and psychology. The institute treats mainly patients from the area of Rabat; however, since it is the main national public referral oncology center, complex oncology cases from all of Morocco are also referred to the NIO for treatment. Within the hospital, two departments were created for gynecologic and breast cancers, and for digestive cancers in order to offer highly specialized management for these frequent cancers in Morocco.

To be able to reduce the waiting times before the initiation of cancer treatment, an institutional decision was made to ensure a medical consultation on the day the patient arrives for the first time at the hospital. In 2018, a pilot experience was initiated to improve the pathway of colorectal cancer patients. A multidisciplinary committee has proposed the optimal treatment times. Thus, it was advised that a maximum period between the dates of the first consultation and the multidisciplinary decision, and between the dates of the first consultation and the first treatment should be 15 and 30 days, respectively. In order to achieve these goals, a multidisciplinary coordination team was created, and specific procedures dedicated to new colorectal cancer patients were put in place. In addition, a nurse navigator was appointed to manage the patients' pathway, in accordance with these procedures. The aim of this strategy was to provide timely labs and imaging appointments for patients to ensure the respect of the above-mentioned times.

In addition, it was decided that new patients with colorectal cancer that were referred to the NIO would be first seen by a surgeon in the absence of distant metastasis, or by a medical oncologist in case of distant metastasis. In this study, we focus on the patients who have been managed by the digestive surgical oncology department within this project.

Description of methods

In order to perform a complete analysis, we used a convergent design, combining quantitative and qualitative approaches at the same time [15]. Thus, we analyzed quantitatively the process indicators for our care pathway management, and we conducted semi-structured interviews with involved specialists from core departments as well as with patients, in order to explore outliers in throughput times until data-saturation was reached.

Quantitative study

A retrospective analysis of waiting times between the first consultation and the multidisciplinary team meeting (MDT) therapeutic decision (T1), and between the first consultation and the first treatment (T2) was performed. Additionally, a univariate analysis was performed to identify which patient characteristics correlated with long waiting times. All consecutive patients with histologically proved colorectal cancer, who had their first consultation at the surgical department between January 1st and June 31st, 2019 were included. Non-inclusion criteria were patients seen by other specialists on the first consultation, and patients admitted in an emergency condition. Patients who did not return after their first consultation were excluded from the analysis.

The included patients were identified from the electronic health record of the NIO using the codes C18, C19, and C20 of the International Classification of Diseases for Oncology (ICD-O3) [16]. The following information was then extracted: age, insurance (low income patients with basic medical insurance, medical insurance, no medical insurance), the distance between the hospital and patients' homes (> 100km and < 100 km), date of the first consultation at the hospital, date of the first presentation in the

MDT, date of the first treatment, type of the first treatment (surgery, chemotherapy, radiotherapy), and type of strategy (curative, palliative, best supportive care).

The main outcomes were defined as follow:

T1 represents the period in days between the first consultation and the first presentation in the MDT. The rate of patients who had T1 > 15 days was calculated.

T2 represents the period in days between the first consultation and the first treatment. The rate of patients who had T2 > 30 days was also calculated.

Additionally, a univariate analysis was performed to identify which factors correlated with delays for both T1 and T2.

Quantitative data are expressed as mean with standard deviation or median with quartiles as appropriate. Qualitative data are expressed in numbers and percentages. To identify factors associated with delays in period T1 and period T2, Chi-square test or Fisher test for qualitative variables and t-test of Student or Mann-Whitney-U test for quantitative variables were used as appropriate. The result was considered significant when p was less than 0.05.

Qualitative study

Our qualitative approach was based on both the recommendations for a Case Study [17, 18] and the principles of Grounded Theory (GT) [19–22].

Participant recruitment

We aimed to analyze the perspectives of three groups of participants: physicians, nurses/coordinating staff members, and patients and/or their relatives. The participants were recruited on a voluntary basis. However, we made sure that the physicians and nurses participating in the interviews were directly involved in the management of cancer, either in the care, or in the coordination, and that all the associated specialties in the pathway of the patient suffering from colorectal cancer have been represented so that the study integrates the multidisciplinary aspect. When it comes to patients, we took into consideration their state of health and their predisposition to follow the interview session. The patients were interviewed either at the daily consultation of the department or while they were hospitalized for colorectal cancer during the quantitative study period. It should be noted that sometimes, it is people accompanying patients who were interviewed for communication reasons or unavailability.

Data Collection

A semi-structured interview guide (Annex 1) served as the basis for open-ended questions to patients and was redesigned to capture the perspectives of professionals. The sequencing of the questions was adapted according to the context as the sessions unfolded. At the beginning of each interview, the objective of the study was stated, specifying that the comments collected would be anonymous, and that

the interviewee could at any time withdraw from the interview. It was only after obtaining consent, including taking notes and sometimes complete verbatim, that the interview began. We preferred not to make any recordings so that the interviewees would be more comfortable during the interviews.

Data analysis and saturation

The data obtained after each interview were systematically analyzed to detect the concepts that emerged from it. This allowed us to better orient the subsequent interviews to not only confirm or deny the results obtained, but also to code the different constructs and group them.

We decided to stop recruiting participants from each group when we no longer were getting new input to the results obtained.

Validity

First, we constantly triangulated the results obtained from the three groups of participants. Then, we regularly carried out additional interviews exclusively with the two groups of professionals in order to confirm or refute the results that had emerged. Finally, there was a constant recourse to the literature on the subject studied.

Results

From the quantitative study

During the study period, 88 patients were seen first at the surgery department among 205 new patients with colorectal cancer that were seen at the NIO. Five patients did not return after the first consultation and were therefore excluded from the analysis.

Amongst the remaining 83 patients that were included in the study, there were 43 women (51.8%), and the mean age was 59.7 years. 52 patients (62.6%) had basic medical insurance and 34 patients (40.9%) lived more than 100 km away from the hospital. Table 1 presents patient characteristics.

Table 1
Patient characteristics

Variable	Result
Gender	
Men	40 (48.2%)
Women	43 (51.8%)
Age, mean (years)	59.7 years
Cancer location	
Colon	34 (40.96%)
Rectum	49 (59.03%)
Medical insurance	
Basic*	52 (62.65%)
Standard	26 (31.32%)
No	5 (6.02%)
Distance from hospital	
< 100 Km	49 (59.03%)
> 100 Km	34 (40.96%)
MDT decision	
Yes	79 (95.18%)
No	4 (4.81%)
Treatment decision	
Curative	66 (79.51%)
Palliative	14 (16.86%)
Best supportive care	3 (3.61%)
First treatment	
Surgery	30 (36.14%)
Chemotherapy	17 (20.48%)
Radiotherapy	25 (30.12%)

*Basic medical insurance a special public medical insurance created for poor populations covering basic and chronic diseases such as cancer.

Variable	Result
No treatment	11 (13.25%)
*Basic medical insurance a special public medical insurance created for poor populations covering basic and chronic diseases such as cancer.	

Analysis of T1

79 patients (95.2%) were presented in an MDT. The median duration of T1 was 16.53 days and 25 patients (30.1%) exceeded the advised 15 day T1 period. Younger age, patients with basic medical insurance, rectal cancer, and radiotherapy as first treatment were statistically associated with delays in T1 (Table 2).

Table 2
Factors associated with longer times between the first consultation and MDT presentation (T1)

Variable	T1 > 15 days	p
Gender		
Men	10/39 (25.6%)	0.33
Women	15/40 (37.5%)	
Age years, mean	53.6 vs. 62.1	**0.01**
Cancer location		**0.001**
Colon	3/31 (9.7%)	
Rectum	22/48 (45.8%)	
Medical insurance*		**0.01**
Basic	23/51 (45.1%)	
Standard	2/23 (8.7)%	
No	0/5 (0%)	
Distance from hospital		**0.02**
< 100 Km	20/48 (41.7%)	
< 100 Km	5/31(16.1%)	
Treatment decision		0.32
Curative	20/62 (32.3%)	
Palliative	3/14 (21.6%)	
Best supportive care	2/3 (66.7%)	
First treatment		0.03
Surgery	5/27 (18.5%)	
Chemotherapy	5/16 (31.3%)	
Radiotherapy	13/25 (52.0%)	

*Basic medical insurance a special public medical insurance created for poor populations covering basic and chronic diseases such as cancer.

Analysis of T2

The date of the first treatment was available for 72 patients (86.75%). For the 11 remaining patients, three refused the proposed treatment, three chose to be treated elsewhere, and no treatment was indicated

during the MDT (best supportive care) for five patients. Among the 72 patients treated at the NIO, the median T2 duration was 45.36 days, and 39 patients (54.2%) exceeded the advised 30 day T2 period. Basic medical insurance and rectal cancer were statistically associated with delays in T2 (Table 3).

Table 3
Factors associated with longer times between first consultation and treatment initiation

Variable	T2 > 30 days	p
Gender		
Men	16/33 (38.5%)	0.37
Women	23/39 (59.0%)	
Age years, mean	57.1 vs. 61.0	0.22
Cancer location		0.001
Colon	10/31 (32.3%)	
Rectum	29/41 (70.7%)	
Medical insurance		0.0001
Basic*	33/46 (71.7%)	
Standard	6/22 (27.3%)	
No	0/4 (0%)	
Distance from hospital		0.76
< 100 Km	25/45 (55.6%)	
< 100 Km	14/27(51.9%)	
Treatment decision		0.23
Curative	30/59 (50.8%)	
Palliative	9/13 (69.2%)	
Best supportive care	NA	
First treatment		
Surgery	13/30 (43.3%)	0.08
Chemotherapy	8/17 (47.1%)	
Radiotherapy	18/25 (72.0%)	

*Basic medical insurance: a special public medical insurance created for poor populations covering basic and chronic diseases such as cancer.

From the qualitative study

We carried out 26 interviews during the months of July, August, and September 2019: 11 patients, nine university professors specialized in digestive surgery, oncology, gastroenterology, radiology, and radiotherapy, one resident doctor (digestive surgery), a consultant (PhD in healthcare management), and six nursing and coordination staff members. All the interviews were conducted in person except for two that were by phone. The average duration of the interviews was 50 minutes.

The results are presented by categories of three groups: Physicians (P), Nursing and coordination staff (N), patients (P). We summarize below the perceptions of the three groups:

Patients' perception

Trust and gratitude

The patients that were interviewed expressed their confidence in the healthcare professionals and their gratitude. They all were convinced that they were receiving the best care and support they could get.

"Everything we asked for, we got. "(Patient, P7)

Patient pathway

The patient journey was often described as excellent hospitality, caring staff, prompt care, and treatment in very good conditions. There were however a few patients who complained about the large crowd of people at the various reception points. These patients also found the administrative procedures to be substantial. Some patients initially traveled from distant cities, and sometimes had to wait to be called back to collect test results from the suited departments by traveling again when their state of health did not necessarily help.

"When I arrived at the reception for consultation, it was very crowded. I felt suffocated. Then I had a lot of paperwork to go through. Also, to save time, I had to do a CT scan in a private facility." (Patient, P9)

"After my consultation, I had to come back to my hometown. I was distressed every day while waiting for a call back from the hospital. A month later, I was contacted and I then had to make the trip again, which of course took me all day, and I also had to plan all the logistics including my food that I needed to bring myself." (Patient, P11)

Communication, awareness, and denial

Patients do not necessarily have a fair understanding of their illness and health. They often have little knowledge of their medical condition, and the people accompanying them are not inclined to understand the details of the diagnosis and treatment, and even less to inform the patients about their health condition.

"I'm not worried about my condition, just a mild gut disease" (Accompanying person, P6)

Accompanying

Most patients are accompanied by family members or friends who are present throughout the various procedures and who also provide the necessary psychological support.

Supply chain

When it comes to supply chain management, it is mainly the logistical aspect that is often mentioned. On the one hand, several elements are appreciated: reception circuit, cleanliness, hospital rooms, elevators, speed of analyses, and availability of diagnostic means. On the other hand, certain grievances have been reported: delayed imaging, unavailable blood for surgery, out-of-order equipment. These factors are sometimes criticized for contributing to the additional waiting times.

"She has been waiting for a CT scan appointment for two months" (Accompanying person, P2)

Outcomes

There were no elements that were expressed by patients regarding the impact of treatment time on the outcome of their transition to the NIO. Actually, several patients who have gone through other private or public facilities before arriving at the NIO expressed an overall feeling of satisfaction given the speed and quality of care from reception to hospitalization. The previous ups and downs and even the additional delays possibly caused in their new journey did not seem to affect this positive overall assessment.

"I felt problems with my abdomen and after several consultations in the city where I live, I went under the knife three times without noticeable results. People around me then recommended that I go to the NIO, and I did. The contrast was stark in every way even though I still had to go out of my hospital room myself to complete administrative formalities." (Patient, P5)

Nursing and coordination staff's perception

Administrative procedures

It was expressed that additional delays of varying lengths could be caused by the obligation of the patient himself/herself or his/her companion to complete some administrative formalities. It can be a question of payment methods and/or health insurance, and also the need for validation of some stages in the therapeutic process.

"The pathway is different depending on financial support. Supporting documents are sometimes lacking. Depending on the case, the intervention of social assistance may be necessary" (Nursing and coordination staff, N5)

Psychological support

It was pointed out that the stress and fear that patients feel should be taken into account in communication both at the diagnostic and treatment levels. The reluctance of patients to follow their respective indicated procedures would lead to additional delays or sometimes abandonment.

Patient follow-up

Coordination and follow-up become complicated when patients have not fully grasped the timing and sequencing of the different therapeutic stages between chemotherapy, surgery, and radiotherapy.

"Patients do not understand for example the reason for several radiotherapy sessions" (Nursing and coordination staff, N6)

Human and material resources

Several interviewees cited delays caused by imaging explorations, and more particularly when it came to retrieving radiology reports. Similarly, it has been reported that sometimes, appointments set for patients are postponed due to the unavailability of human resources.

Physicians' perception

Doctor-Patient interactions

Communication with patients depended on their level of education. A significant proportion of patients have a low socio-demographic profile which is characterized by a low education level that makes it difficult to fully understand the diagnosis and therapeutic strategies. The time and effort required are allocated to explain and reassure patients who sometimes show emotional overload or even denial. Cultural aspects such as destiny and spirituality have been reported to play a role in how patients regard the diagnosis and accept it.

"We are trying to adapt our language according to the dialect used by the patient and their level of education. Sometimes we feel that patients are not fully aware of the proposed therapeutic process." (Physician, P1)

Ethics

All physicians expressed adherence to the principles of integrity, transparency, and governance. They displayed a total dedication in the care of patients with a foolproof availability even if the overload is sometimes reported. Physicians have to manage their schedules between consultations, on-call shifts, surgical procedures, training, information, coordination, and follow-up actions with patients.

"We often have to discuss 40 patients during our multidisciplinary meetings, and deal with the management of the decisions that follow" (Physician, P2)

Coordination necessity

Despite being aware of all their professional obligations, physicians expressed the difficulty of ensuring individualized monitoring of patients. The need for a coordination mechanism was clearly expressed.

"It is necessary to have a coordination staff because it is very difficult to remember all the patients" (Physician, P3)

Quantity or quality

Certain periods have been deemed incompressible, such as for radiotherapy. Little would be better than doing too much. Some additional tests are considered to be not mandatory.

"If we want to improve quality, we must manage fewer patients" (Physician, P8)

Information system

The vital role of the information system has repeatedly been raised. For physicians, this was an important asset in order to make the necessary concerted decisions.

Discussion

The quantitative study showed that waiting times exceeded hospital targets for both periods that were studied. In fact, the waiting time exceeded the accepted duration between the first consultation and the MDT presentation in 30.1% of cases, and between the first consultation and the treatment initiation in 50.2% of cases. For both periods, patients with basic medical insurance, and patients with rectal cancer experienced longer waiting times.

The qualitative approach made it possible to identify the perception of these waiting times by three groups: patients, nursing and coordination staff members, and physicians. The collection of the feedback demonstrated a certain degree of satisfaction with the patient journey while highlighting some areas for improvement.

This study is one of the few to adopt a mixed, quantitative and qualitative approach, to analyze the factors contributing to prolonged waiting times for colorectal cancer treatment. Such a study could contribute to a benchmarking capable of serving as a reference for cancer treatment units. On the quantitative level, we were able to analyze the cases of all consecutive digestive surgical oncology department (SCOD) patients for six months. This analysis was carried out after the decision to put in place a coordination process to support the patients and adopt the option of offering them a consultation the same day without delay. Qualitatively, we were able to interview a significant population belonging to three different groups, with effective support and availability on the part of the interviewees.

It should be pointed out from the outset that the decision taken by the NIO to carry out specialized consultations on the same day for new patients contributes directly to reducing the overall waiting time, and the time to obtain an appointment with a specialist surgeon is cited as a significant phase in the

patient pathway [11, 23–25]. The study has shown that the action of improving the quality of care at the hospital level could be handled in two ways: bottom-up creative strategies at the hospital level, and a top-down normative strategy from a more centralized level [26]. The bottom-up strategies are more effective as they involve people who are directly managing the care process and who are the most aware of the problem. This approach makes it possible to engage in a collective problem-solving dynamic that is part of any quality improvement plan. It was observed that the effect of top-down approaches in implementing quality management tools is not sustainable as the ownership of the project is placed at a higher level of the management and won't take into account local specificities related to the nature of each hospital. Our results also show that there is room for creativity in order to develop actions that aim to adapt the hospital to its complex environment and context. The documentation of these initiatives may contribute to developing a learning system for health policies directed towards more involvement of the operational level in designing and proposing policy directions especially for quality improvement actions [28]. Involving patients and considering their perspective in this analysis would help build a more comprehensive approach that targets patient satisfaction and puts both the service and the patient at the center of health strategies [27]. The analysis of the professional perspective would bridge the perception gap and would certainly introduce a systemic thinking. A system thinking for professionals is an important step towards integrating the professional logic into a more systemic vision to adapt the care organization and process to the complexity of the system in which they operate. Our study could also be considered as a starting point for a whole dynamic of documenting care management initiatives and experiments in a way that would eventually improve the knowledge management function at the level of the hospital. It also has paved the way for other research projects to examine the possibility of engaging action research that will accompany quality improvement strategies at all levels in the health system.

With regard to the objectives set by the NIO for the two waiting times that were the subject of the quantitative study, two important factors were highlighted:

The financial aspect

A large proportion of patients are covered by a basic health insurance scheme for the economically poor called "RAMED", which aims to provide financial protection with the objective of achieving universal health coverage [28]. In 2016, there were more than 10 million beneficiaries with the need for those entitled to carry out administrative formalities by regularly updating their situation [29]. This coverage, although it provides complete care for the patients concerned, requires administrative procedures that sometimes lead to processing delays and the verification of eligibility conditions. Likewise, additional waiting times may be generated by long queues for medical tests or the cyclical unavailability of resources for the diagnosis, knowing that the option of resorting to the private sector is difficult to consider for economic reasons and lack of confidence. Further research on the impact of the waiting time on the increase of out-of-pocket expenditures may help to compare the resources allocated to reduce the time versus the financial implications of the statu-quo option. Indeed, a study that would examine out-of-pocket components as a result of the additional waiting time may help health planners at the level of hospitals to evaluate the additional investment they need to do in order to reduce these costs.

The NIO is the only public center in the area that offers radiotherapy treatment. Therefore, there is strong pressure on the radiotherapy department, which results in longer appointment times, even with the procedures put in place as part of the project.

The differences observed in the objectives for the two waiting times also seem to be perceived differently according to the groups concerned by the qualitative study. As a first level, it is crucial to be able to analyze patients' perceptions of the services they have received and their satisfaction with the results obtained [30]. Overall, patients positively appreciated their pathway; they were mostly satisfied with the care received despite reporting some delays for some medical tests. At no time were waiting times explicitly cited as affecting the process of care. This finding is probably mainly due to the socio-economic characteristics of the majority of patients who often do not have the ability to understand all the elements concerning their state of health [31], and who tend to underestimate the delay and waiting time factor when they are asked to express their input of the quality of their management at the NIO. As for health professionals, and in their concern for excellence, deviations from the objectives set are clearly identified and are more particularly justified by the cyclical lack of material resources in the hospital supply chain. In addition, there were challenges caused by a large number of patients to be treated, causing continuous stress and overload that are likely to make it difficult to balance quantity and quality, including processing as quickly as possible.

Several studies have been devoted to analyzing the different waiting times, including those analyzed by this study. In Canada, the recommendation for a period of 15 days between the diagnosis time and the time for the first treatment is exceeded on average in proportions similar to that of the department for reasons related to hospital logistics and criteria relating to the age of the patients and the geographical location [32]. Distance from the hospital was not associated with longer delays in our study. In Portugal, the average waiting time for colorectal cancer surgery was one month in 2007 [23] in a context where universal health coverage was achieved, but with reported disparities depending also on geographical location. This average time varies however depending on the severity of the disease. For South Korea, the waiting time between diagnosis and surgery for different types of cancer typically does not exceed four weeks and depends on factors associated with patients, providers, and the health system [33]. Furthermore, it was also mentioned that the technical infrastructure necessary for exploratory examinations influences waiting times [34].

It was not possible for us to carry out benchmarking both internally and externally. This hindrance was due to the lack of data from the past years and to the lack of studies on this subject in other oncology centers. On a national level, waiting times were also relatively impacted by cyclical deficits in the logistics chain, as well as a lack of human resources. Finally, it is difficult to generalize the conclusions of this study, which was limited to a single center whose characteristics are not necessarily the same for other hospitals.

Despite the limitations discussed above, this study has made it possible to identify two key factors that may have impacted the objectives set in terms of waiting time in colorectal cancer patients' surgical

pathway: the administrative aspects of management and the multidisciplinary nature of intervention on the medical level. These two aspects require management and coordination to ensure the efficiency and quality necessary to treat all patients on time. These results highlight the fact that appropriate management of both logistical and human resources is just as critical for the medical management of a cancer patient for whom the time to diagnosis and treatment can be decisive. For health policy in Morocco, this initiative may inform policy-makers to design a strategy to empower health services' managers to experiment with new ways of organizing the care process. It's also important to create, at the national level, a sharing function for these experiments in order to allow each hospital to learn from others' best practices. The documentations of local projects on quality improvement will help to facilitate the sharing of the best modes of organizing services with in-depth analysis that covers all contextual issues.

Several research perspectives could be considered. First, it would be necessary to conduct similar studies with other oncology centers to benchmark and come up with more generalizable results. Second, it would be interesting to go deeper into the administrative pathway to analyze the factors influencing waiting times with a particular focus on poor patients under basic medical insurance. In addition, an analysis of the delays induced by the adoption of radiotherapy as part of the therapeutic strategies decided upon should be carried out. Finally, there is a need to improve the sizing of human and material resources capable of improving waiting times.

Conclusion

In this pilot study performed in a low-mid income country, the main reasons for the delay in the treatment of colorectal cancer were the patient's low socio-economic level and rectal cancer. Increasing coordination and adapted procedures may improve these results.

Abbreviations

NIA
National Institute of Oncology.
MDT
Multidisciplinary team meeting.

Declarations

Ethics approval and consent to participate

The study was approved by Ethics Committee for biomedical research at Mohammed V university in Rabat (reference 113/19). All participants gave their verbal consent to participate in the study. As the participation to the interviews was voluntary, written consent was not requested.

Consent for publication

 Not applicable (retrospective observational study).

Availability of data and material

This study data and material are available upon a reasonable request.

Competing interests

All authors declare no conflict of interest.

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Authors' contribution

SB participated in the study design, conducted the interviews with the participants and wrote the manuscript.

MAM designed the study, supervised the research project, performed statistical analysis and participated in drafting the manuscript.

MD performed data collection and participated in statistical analysis.

KH participated in drafting the manuscript.

AS, AB, RM and OB participated in the content discussions and the research design.

All authors have read and approved the final manuscript.

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