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Research Article

Satisfaction of Cancer Patients Treated with Oral Anticancer Medications regarding Dispensing by Community Pharmacists: A Cross-Sectional Study

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Purpose. The growing choice of oral anticancer medications (OAMs) delivered in pharmacies puts the patients at the center of their own therapeutic management. Patient satisfaction regarding their pharmaceutical management is particularly important for adherence to their treatment. The aim of this study was to assess the satisfaction of patients treated with OAMs regarding their dispensing in community pharmacies. *Methods*. A cross-sectional study was conducted with a self-questionnaire proposed to patients in hospital centers and community pharmacies. The patient's satisfaction regarding pharmacy dispensing was assessed with a visual analogue scale. Answers to questions about the quality of information they received from health professionals were recorded. The patient's adherence to their medication was assessed with the 8-item Morisky Medication Adherence Scale (MMAS-8). Symptoms and quality of life were recorded with the QLQ-C30 questionnaire. *Results*. Ninety-one patients were included in the analysis. The median score of satisfaction was 89 (interquartile range: 68, 100), and 49.5% had a satisfaction score ≥90/100. Satisfaction scores were higher for patients reporting information from pharmacists for the method of administration, the management of adverse effects, and drug interactions than for patients reporting no information from pharmacists. Patient satisfaction was not related to MMAS-8 scores, symptoms, or quality of life. Multivariate analysis of patient satisfaction revealed a positive relationship with information on the administration method provided by pharmacists. *Conclusions*. The level of information provided on OAMs to patients should be the same between pharmacists and oncologists. Good medication dispensing practices by the pharmacist are important components of patient care and satisfaction. We encourage pharmacists to provide more medication information to their patients.

1. Introduction

Community pharmacists ensure that the quality and safety of medication dispensing are guaranteed at all times by limiting as far as possible the risks associated with an error in delivery, prescription, drug interactions or undetected contraindications, inadequate dosages, or noncompliance with treatment [1]. The longer the patient feels satisfied with the stage of delivery of their treatment, the better their adherence to the treatment, resulting in improved compliance [2].

Traditionally, in oncology, chemotherapy treatments are administered intravenously by trained staff and are rarely managed by the patient at home. However, in recent decades, the number of oral anticancer medications (OAMs) has increased, whether for conventional cytotoxic, hormonal, or targeted therapies, representing a shift of paradigm in cancer care [3]. OAMs put the patients at the center of their own therapeutic management, and in an oncological context, patients' understanding, knowledge, adherence, and compliance have become particularly important to achieve an optimal risk-benefit ratio [4]. From the patient's perspective, OAMs raise numerous safety concerns such as adherence (nonadherence rates ranging from 0 to 54%), storage and handling specificities, absorption influenced by the patient's diet (half of OAMs) and gastric pH (fifth of OAMs), drug and food interactions related to the induction or inhibition of cytochrome P450 enzymes (two third of OAMs), and the prevention, detection, and treatment of adverse effects [5].

In France, most OAMs are delivered in community pharmacies, and a limited number of OAMs can be delivered by hospital pharmacists (out-patient dispensing of hospital-reserved drugs) [6]. Consequently, the roles of pharmacists in dispensing OAMs and managing cancer patients have increased in recent decades [7]. In 2020 in France, out of a total medication expenditure of 5.9 billion euros, 3.12 billion euros (52.9%) were related to the delivery of anticancer medications in pharmacies, including 2.03 billion euros (65%) for targeted therapies [8]. Despite this evolving role, little is known about the patient's satisfaction regarding their pharmaceutical management. This study aimed to assess the satisfaction of cancer patients treated with OAMs regarding the dispensing of the latter in community pharmacies and explore the patient-pharmacist relationship in cancer pharmaceutical management.

2. Materials and Methods

2.1. Study Design. The main objective of this multicenter and cross-sectional study was to assess the overall satisfaction of cancer patients with the quality of OAMs dispensing in community pharmacies. The secondary objectives were to assess the relationship between patient satisfaction with (1) the quality and type of information on OAMs given by the pharmacist, general practitioner (GP), and oncologist; (2) medication adherence; (3) oncological characteristics; (4) patient characteristics; and (5) symptoms and health-related quality of life (HRQoL).

The study protocol was designed to conform to the STROBE (Strengthening the Reporting of Observational Studies in Epidemiology) guidelines for reporting observational studies [9]. The study has been registered on the ClinicalTrials.gov Identifier NCT03961789 (May 23, 2019). The study was anonymous, approved by the local ethics committee (No.2017/CE08, May 04, 2017, Comité de Protection des Personnes sud-est 6, IRB: 00008526), and in accordance with the Declaration of Helsinki. After being informed about the aim of the study, the participants' informed consent was obtained through the survey.

2.2. Setting. This multicenter study was coordinated by the University Hospital of Clermont-Ferrand (France). All the participants were recruited through the oncology departments of hematology, urology, pulmonology, gastroenterology, and dermatology in three hospital centers (University Hospital of Clermont-Ferrand, Hospital of Le Puy-en-Velay, and Hospital of Mende, France) and from community pharmacies (five pharmacies in Clermont-Ferrand, France, known to manage cancer patients). This study (patient inclusion and data collection) was conducted between June 2017 and July 2018. Cancer patients answered once to the questionnaire, with no follow-up.

2.3. Participants. Participants could be included in the survey if they were cancer patients receiving OAMs delivered in a community pharmacy for the treatment of cancer. Exclusion criteria were defined as follows: patients who were unable to understand or respond to questionnaires and age <18 years.

This study was conducted as a survey by contacting each eligible patient after being fully informed by the oncologist or the pharmacist. After acceptance, the patients receive the questionnaire by post with a stamped-addressed envelope for the return of the completed questionnaire.

2.4. Variables. The primary outcome measured was the patient's satisfaction with the dispensing of their OAMs by a community pharmacy. The participants responded to the question "Are you generally satisfied with the quality of dispensing of your oral anticancer treatment by a community pharmacy?" by assessing their score with a visual analogue scale (VAS; 0: not at all satisfied, 100: fully satisfied).

The secondary outcomes were the assessment by the patient of the quality of the information dispensed by the oncologist, the pharmacist, and the GP about their OAMs with a VAS score (0: not at all satisfied, 100: fully satisfied) and the type of information dispensed (method of administration, management of adverse effects, and drug interactions). The patient's adherence to their medication was assessed using the 8-item Morisky Medication Adherence Scale (MMAS-8) [10], to determine their adherence level. If the total score was less than 4, the patient was considered nonadherent. There were two types of questions in the MMAS-8: items 1, 4, 5, and 8 were questions for

unintentional nonadherence and items 2, 3, 6, and 7 were for intentional nonadherence. Other information recorded was the type of cancer and their prescribed OAMs from a list including all the OAMs available in pharmacies in France. The length in weeks since the patient has taken their medication was also requested, as well as the number of medications taken per day. The patient's characteristics were also recorded such as age, gender, professional status, marital status, and the education level. The symptoms and HRQoL were recorded with the QLQ-C30 questionnaire, including five functional aspects (physical, role, emotional, cognitive, and social), eight symptoms (fatigue, nausea/vomiting, pain, dyspnea, insomnia, appetite loss, constipation, and diarrhea), financial difficulties, and global quality of life [11].

2.5. Data Sources/Measurement. All the data were obtained from a paper questionnaire completed by the patients. All the study data were collected and managed using REDCap electronic data capture tools (Vanderbilt University, Tennessee, US) hosted at CHU Clermont-Ferrand [12].

2.6. Study Size. This cross-sectional study assessed the satisfaction of patients treated with OAMs regarding the dispensing of the latter in community pharmacies. The sample size has been estimated to describe satisfaction scores with a satisfactory accuracy. For a standard deviation of satisfaction scores expected at 25 (out of 100) and an accuracy close to 5 (out of 100), at least 90 patients were needed for a two-sided type I error at 5% [13].

2.7. Statistical Methods. Continuous data were expressed as the median and interquartile range. The normality was assessed using the Shapiro–Wilk test. Patients' satisfaction for the dispensing of their OAMs was compared between independent groups (information on methods of administration, management of adverse effects, and drug interactions) using the Student's *t*-test or the Mann–Whitney *U* test when the assumptions of the *t*-test were not met. The homoscedasticity of the data was assessed using the Fisher–Snedecor test. The results were expressed using Hedge's effect-size (ES) and 95% confidence interval (95% CI) and were interpreted according to the rules of thumb reported by Cohen [14] (small ES = 0.2, medium ES = 0.5, and large ES = 0.8). Categorical data (satisfaction categorized according to statistical distribution, i.e., satisfaction score-$\geq$ 90/100) were compared between the groups using the chi-squared test or Fisher's exact test. To analyze the relationships between continuous parameters, Pearson and Spearman correlation coefficients (rho) were estimated according to the statistical distribution of variables and by applying Sidak's type I error correction (negligible < 0.2, weak 0.2 to 0.4, moderate 0.4 to 0.7, and strong > 0.7) [15]. To determine the factors associated with patients' satisfaction scores for the dispensing of their OAMs by pharmacists, multivariable analysis was performed using multiple linear regression, including patients' characteristics (age and the level of education) and the following covariates: source of questionnaire transmission (oncology departments or pharmacies), type of OAMs (targeted therapy or hormonal therapy), and information received (method of administration, adverse effects, and drug interactions). Particular attention was paid to the study of multicollinearity and to the interactions between covariates: (1) studying the relationships between the covariables and (2) evaluating the impact of adding or deleting variables on a multivariable model. The results are expressed as regression coefficients and 95% CI, and forest plots were used to present the results. Concerning paired data comparisons (i.e., information on methods of administration, the management of adverse effects, and drug interactions between pharmacists, GPs, and oncologists), random-effects models were performed to take into account between- and within-patient variability. Sidak's type I error correction was also applied for two by two multiple comparisons. Statistical analyses were performed using Stata 15 (StataCorp, US). All the tests were two-sided, with a type I error set at 5%. In accordance with the literature [16–18], we reported all individual p values without systematically applying any mathematical correction to the aforementioned tests comparing groups. Specific attention was given to the magnitude of differences (i.e., ES and rho) and clinical relevance.

3. Results and Discussion

3.1. Sample Description. One hundred and four patients agreed to take part in this study and responded to the questionnaire, of which 91 patients were included and analyzed (Figure 1). Included patients were mostly women (62.6%) with a median age of 69 (58, 76) years old, in a couple (69.2%), retired (65.8%), and with a middle school certificate (36.3%). The most commonly represented cancers were breast (25.3%), lung (24.2%), and hematological malignancies (19.8%). The duration of OAMs was approximately 38 (11, 125.5) weeks. The majority of patients had visited only one pharmacy during the last 6 months (60.4%). Most of the participants obtained their treatments by themselves from pharmacies (82.4%). The number of daily medications was 3 (2, 5). The questionnaire was mostly provided by oncology departments (84.6%), with the remaining from pharmacies (15.4%) (Table 1). Among the prescribed OAMs, patients mostly took targeted therapies (67.3%), followed by hormone therapies (23.5%) and cytotoxic ones (9.2%) (Supplementary materials) (available here).

3.2. Satisfaction of Patients regarding Community Pharmacy Dispensing. VAS satisfaction scores regarding pharmacy dispensing were about 89 (68, 100) (rated from 0 to 100), and 49.5% (45) of participants had a satisfaction score ≥90/100. The satisfaction scores were not related to gender, marital status, or professional activity. However, the satisfaction scores were significantly related to the patients' educational level. Nongraduated patients had higher satisfaction scores compared to patients in other categories (nongraduated: 100

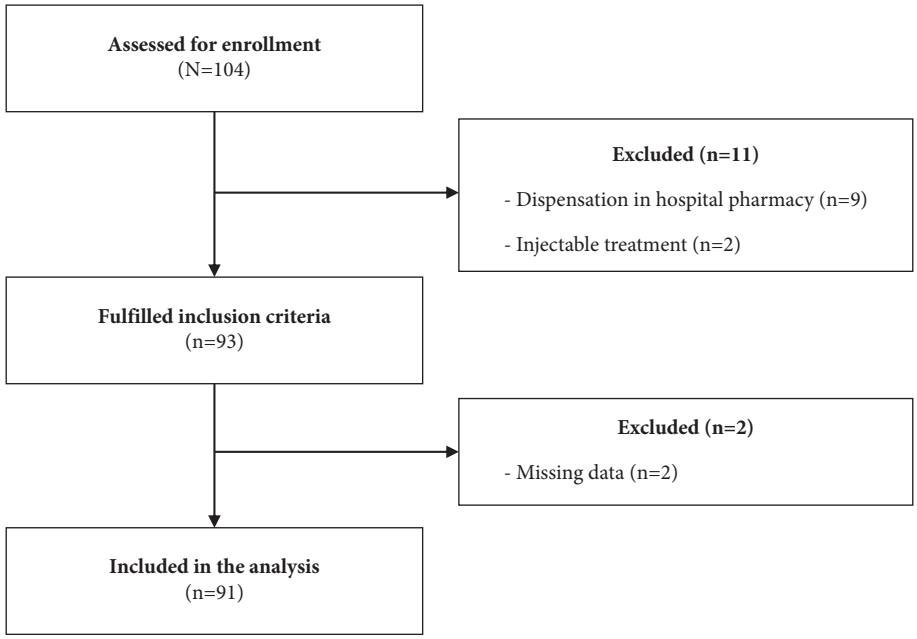

Figure 1: Flow diagram of the patient selection.

(90, 100) vs. general certificate of secondary education: 82 (48, 95) vs. high school certificate: 92 (85, 100) vs. bachelor or higher degree: 81 (65, 99), $p = 0.014$). There was a significant relationship between the number of pharmacies visited during the last 6 months and the satisfaction scores. Patients who visited one or two pharmacies had higher satisfaction scores than patients who visited three or more pharmacies (one pharmacy: 86 (66, 100) vs. two pharmacies: 93 (85, 100) vs. three or more 73 (49, 79), $p = 0.013$). The satisfaction scores were not different among the five main malignancies (breast, lung, hematological, melanoma, and kidney; $p = 0.28$) and among the three pharmacological classes of OAMs ($p = 0.49$). Finally, the satisfaction scores did not differ based on the source of questionnaire transmission (oncology departments vs. pharmacies) ($p = 0.60$) (Table 1).

The quality assessed by the patients and the type of information provided by pharmacists, GPs, and oncologists are presented in Table 2. The VAS scores for assessing the quality of the information provided by the pharmacists were not different from those of GPs ($p = 0.28$) but were lower than those of oncologists ($p < 0.001$, ES: −0.91 95% CI (−1.23, −0.61)). The VAS scores for assessing the quality of the information provided by the GPs were also lower than those of oncologists ($p < 0.001$, ES: −0.86 95% CI (−1.16, −0.55)) (Table 2). The VAS scores for assessing the quality of the information provided by pharmacists were moderately correlated with those of GPs (rho: 0.53, $p < 0.001$) and weakly correlated with those of oncologists (rho: 0.29, $p = 0.007$), but the VAS scores of the information provided by GPs were not correlated with those of oncologists (rho: 0.19, $p = 0.09$). All the VAS scores for assessing the quality of the information provided by pharmacists, GPs, and oncologists were correlated to the VAS scores of patients' satisfaction regarding pharmacy dispensing (rho: 0.63, 0.37, and 0.40, respectively, and $p < 0.05$ for all). The type of information provided by health professionals (method of administration, management of adverse effects, and drug interactions) was also assessed by the patients. Regarding the method of administration and the management of adverse effects, fewer pharmacists and GPs provided information on these topics than oncologists ($p < 0.001$ for all) (Table 2). Between pharmacists and GPs, we found no differences concerning the method of administration ($p = 0.053$) and management of adverse effects ($p = 0.61$) (Table 2). Regarding information on drug interactions, no difference was recorded between pharmacists and GPs ($p = 0.64$), and both proportions were lower than oncologist one ($p < 0.001$, for both) (Table 2). The VAS satisfaction scores regarding pharmacy dispensing were significantly higher for patients receiving information from pharmacists for the method of administration, management of adverse effects, and drug interactions than patients receiving no information from pharmacists (methods of administration: 95 (84, 100) vs. 73 (41, 92) ($p < 0.001$, ES: 1.06 95% CI (0.61, 1.49)), management of adverse effects: 96.5 (85, 100) vs. 81 (47, 93) ($p < 0.001$, ES: 0.79 95% CI (0.37, 1.22)), and drug interactions: 93.5 (68, 100) vs. 81 (47, 95) ($p = 0.001$, ES: 0.78 95% CI (0.35, 1.20)).

3.3. Medication Adherence. The median scores on the total, unintentional, and intentional MMAS-8 were 8 (7, 8), 4 (3.7, 4), and 4 (3, 4), respectively. Only 3 (3.5%) patients did not adhere to their treatments (96.6% adherent). No relationship was found between any MMAS-8 scores (total, unintentional, and intentional) and VAS satisfaction scores (rho $< |0.1|$ and $p > 0.05$, for all). In addition, no relationship was found between any MMAS-8 scores (total, unintentional, and intentional) and VAS scores assessing the

Table 1: Characteristics of the patients analyzed ($N = 91$). Results are presented as number (percentage) and median (interquartile range).

Participants	91
Female	62.6 (57)
Male	37.4 (34)
Age	69 (58, 76)
Marital status	
In couple	69.2 (63)
Single	30.8 (28)
Professional activity	
Unemployed	9.9 (9)
Employed	24.2 (22)
Retired	65.8 (59)
Unknown	1.1 (1)
Educational level	
No education	12.1 (11)
Middle school certificate	36.3 (33)
Secondary education certificate	20.9 (19)
Higher education degree	27.5 (25)
Unknown	3.3 (3)
Malignancies	
Breast	25.3 (23)
Lung	24.2 (22)
Hematological	19.8 (18)
Melanoma	8.8 (8)
Kidney	6.6 (6)
Digestive	4.4 (4)
Endocrine	3.3 (3)
Prostate	2.2 (2)
Leiomyosarcoma	1.1 (1)
Pelvis	1.1 (1)
Thymus	1.1 (1)
Thyroid	1.1 (1)
Unknown	1.1 (1)
Number of community pharmacies visited over the last 6 months	
1	60.4 (55)
2	28.6 (26)
3	9.9 (9)
Unknown	1.1 (1)
Number of medications per day	3 (2, 5)
Retrieval of OAMs	
Patient themselves	82.4 (75)
Assisted by carer	17.6 (16)
Duration of OAMs (weeks)	38 (11, 125.5)
Questionnaire transmitted in oncology department	84.6 (77)
Questionnaire transmitted in community pharmacy	15.4 (14)

quality of the information provided by pharmacists, GPs, and oncologists (rho < |0.1| and $p > 0.05$ for all), except for intentional MMAS-8 scores, which were weakly correlated to VAS scores assessing the quality of the information provided by oncologists (rho: 0.24, $p < 0.05$).

3.4. Symptoms and Quality of Life. The scores of the QLQ-C30 questionnaire are presented in Table 3. No correlation was identified between the QLQ-C30 items and the VAS satisfaction scores. Only the nausea and vomiting scores of the QLQ-C30 questionnaire were lower in patients with satisfaction scores ≥90/100 compared to patients with satisfaction <90/100 (0 (0, 16.7) vs. 16.7 (0, 33.3), $p = 0.049$, ES: −0.44 95% CI (−0.86, −0.02)). No other differences were recorded between these two groups of patients (data not shown).

Most of the QLQ-C30 items were not correlated to VAS scores assessing the quality of the information provided by pharmacists, GPs, and oncologists, except for weak correlations for information provided by GPs and constipation, and information provided by oncologists and insomnia and diarrhea ($p < 0.05$ for all) (Table 3).

Several items of the QLQ-C30 were weakly correlated with the MMAS-8 scores (total and intentional), with the highest correlations observed for role functioning, fatigue, and appetite loss (rho > 0.3, $p < 0.05$) (Table 3).

3.5. Multivariate Analysis of Patients' Satisfaction regarding Community Pharmacy Dispensing. Multivariate analysis of patients' satisfaction, including patients' age, level of education, source of questionnaire transmission (oncology departments or pharmacies), type of OAMs (targeted therapy or hormonal therapy), information on the method of administration, information on adverse effects, and information on drug interactions, revealed a positive relationship with information on the administration method (Figure 2).

4. Discussion

Patients' satisfaction scores regarding the quality of OAMs dispensing in community pharmacies were generally high (median 89 out of 100), with about half of them having scores ≥90, but without relationship with most patient characteristics, cancer type, OAM type, medication adherence, or HRQoL. However, patients with lower education levels or those visiting one or two pharmacies reported higher satisfaction scores compared to patients with higher education levels or those visiting three or more pharmacies. Patients reported higher satisfaction scores when pharmacists provided information on the method of administration, management of adverse effects, and drug interactions. Multivariate analysis showed that satisfaction scores were particularly related to the information provided by pharmacists about the method of medication administration. Interestingly, the study found that pharmacists offered less information on the method of administration and adverse effects of OAMs compared to oncologists. For information about drug interactions, all three health professionals (pharmacists, oncologists, and GPs) provided relatively low levels of information, with no significant difference between them.

The population of the study seemed to be quite representative of the general population and the main characteristics of cancer in France. The median age at diagnosis was evaluated in 2018 at 67 years old for women and 68 years old for men [19], which corresponds to the median age in this study (66.5 years old). The higher proportion of women (62.6%) can be explained by the large proportion of breast

Table 2: Satisfaction with quality of information and type of information provided by pharmacists, GPs, and oncologists. The quality of information provided by pharmacists, general practitioners (GPs), and oncologists was assessed by the patients with a VAS score (median (interquartile range)). The type of information (the method of administration, adverse effects, and drug interactions) is presented by the percentage and (number). *P* values are provided for comparisons between community pharmacists and oncologists, GPs and oncologists, and community pharmacists and GPs.

		vs. oncologists	vs. GPs
Community pharmacists			
Satisfaction with quality of information (VAS scores)	56 (11, 90)	$p < 0.001$	$p = 0.28$
Method of administration (yes)	57.1 (52)	$p < 0.001$	$p = 0.053$
Adverse effects (yes)	46.2 (42)	$p < 0.001$	$p = 0.61$
Drug interactions (yes)	41.8 (38)	$p < 0.001$	$p = 0.64$
General practitioners (GPs)			
Satisfaction with quality of information (VAS scores)	57 (25, 90)	$p < 0.001$	—
Method of administration (yes)	46.7 (42)	$p < 0.001$	—
Adverse effects (yes)	48.9 (44)	$p < 0.001$	—
Drug interactions (yes)	38.9 (35)	$p < 0.001$	—
Oncologists			
Satisfaction with quality of information (VAS scores)	89.5 (70.5, 100)	—	—
Method of administration (yes)	87.5 (77)	—	—
Adverse effects (yes)	80.7 (71)	—	—
Drug interactions (yes)	69.0 (60)	—	—

Table 3: Scores of the QLQ-C30 questionnaire and correlations with VAS satisfaction scores, the quality of the information provided by pharmacists, general practitioners (GPs) and oncologists, and MMAS-8 scores. QLQ-C30 scores are presented by the medians (interquartile ranges) and correlation coefficients. $^*p < 0.05$.

	QLQ-C30 scores	Correlation coefficients						
		Satisfaction	Quality of information delivered			MMAS-8 (scores)		
			Pharmacists	GPs	Oncologists	Total	Unintentional	Intentional
Quality of life (QoL)	66.7 (41.7, 83.3)	0.17	0.07	−0.12	0.12	0.18	0.02	0.28*
Physical functioning	86.7 (60.0, 93.3)	0.04	−0.04	−0.16	0.10	0.23*	0.09	0.31*
Role functioning	66.7 (50.0, 100)	0.04	−0.01	−0.13	0.20	0.30*	0.17	0.32*
Emotional functioning	83.3 (58.3, 91.7)	0.09	−0.08	−0.16	0.13	0.23*	0.12	0.24*
Cognitive functioning	83.3 (66.7, 100)	0.02	0.06	−0.12	0.11	0.21	0.10	0.24*
Social functioning	66.7 (50.0, 100)	0.11	0.03	−0.12	0.14	0.26*	0.05	0.37*
Fatigue	33.3 (11.1, 66.7)	−0.05	−0.04	0.12	−0.07	−0.31*	−0.16	−0.34*
Nausea/vomiting	0 (0.0, 33.3)	−0.22	−0.16	0.03	−0.14	−0.15	0.19	−0.34*
Pain	33.3 (0.0, 50.0)	−0.13	−0.05	0.10	−0.15	−0.18	0.04	−0.29*
Dyspnea	33.3 (0, 33.3)	−0.04	−0.08	0.16	−0.13	−0.13	−0.04	−0.20
Insomnia	33.3 (0, 66.7)	−0.05	0.02	0.07	−0.24*	−0.20	−0.08	−0.28*
Appetite loss	0 (0.0, 33.3)	0.04	−0.01	0.19	−0.01	−0.35*	−0.18	−0.37*
Constipation	0 (0.0, 33.3)	0.06	0.08	0.25*	0.02	−0.16	0.04	−0.26*
Diarrhea	16.7 (0.0, 33.3)	0.13	0.02	0.17	−0.25*	−0.25*	−0.03	−0.29*
Financial difficulties	0 (0.0, 33.3)	0.03	−0.08	0.08	−0.19	−0.22*	−0.04	−0.29*

cancer. The study clearly shows that targeted therapies are the most used and prescribed [20]. Breast and lung cancers are the most represented in this study. However, there is an under-representation of colorectal and prostate cancers in this study compared to French epidemiological data [19].

In this study, oncologists were the main source of information on OAMs, which is not surprising since, for most patients, their oncologist is the primary provider of cancer care and the specialist in this field [21]. However, we encourage pharmacists to increase the provision of information on OAMs when dispensing medication (method of administration, adverse effects, and drug interactions). Considering that the pharmacist is the last healthcare professional that patients meet before taking their medication, it is essential for pharmacists to provide as much information as the oncologist did.

Regarding education levels, pharmacists must adapt their explanations to each patient. It is well known that patients with a low level of education may also have lower health literacy [22]. Interestingly, patients with lower health literacy tend to have a higher rate of satisfaction with the information provided [23]. Conversely, patients with higher health literacy may be less satisfied with their management, especially in cases of advanced cancer [23].

When it comes to drug interactions, similar results have been reported, with community pharmacists showing a poor level of recognition and management of drug interaction [24–26]. This is concerning, considering that OAMs are

Items	Coefficient	p-value	95%CI	
Age	-0.31	0.09	-0.67	0.05
Education	-8.89	0.23	-23.39	5.61
Source of questionnaire transmission	4.07	0.59	-10.99	19.13
Oral anticancer medication	3.17	0.70	-13.24	19.58
Hormonal therapy	-0.28	0.98	-18.38	17.82
Method of administration	15.52	0.018	2.71	28.32
Adverse effects	2.98	0.70	-12.10	18.06
Drug interactions	7.27	0.30	-6.47	21.00

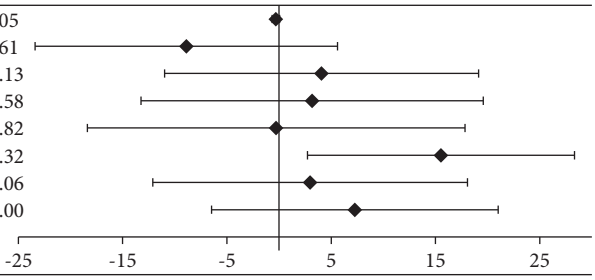

Figure 2: Multivariate analysis of patients' satisfaction for the dispensing of their OAMs by community pharmacists. The multivariate analysis includes age of patients, level of education (reference: no education), source of questionnaire transmission (ref: oncology departments), type of OAMs (reference: no targeted therapy), hormonal therapy (reference: no hormonal therapy), and information provided by the community pharmacist on the method of administration (reference: no information), adverse effects (reference: no information), and the drug interactions (reference: no information). The results are presented by coefficient and 95% confidence interval (95% CI).

frequently associated with drug interactions. For example, in a prospective cohort of 294 patients taking OAMs, 90.8% of them had one drug interaction identified [27]. In a retrospective nationwide real-world data-based study ($N = 11{,}076$), >75% of patients on OAMs had at least one potentially significant drug interaction [28].

Interestingly, it has been demonstrated that patients exhibit strong preferences for overall pharmacy quality, including specific quality in drug interaction management. Patients highly value pharmacists' role in preventing drug interactions, underlining their high expectations in this regard [29].

In the present study, satisfaction scores were not related to HRQoL, whereas it has already been described that satisfaction regarding information is related to HRQoL (global HRQoL, physical well-being, social well-being, emotional well-being, and functional well-being) [30].

Regarding adherence to OAMs, more than 95% of the patients adhered to their medications. This number seems high knowing that adherence to long-term therapy for chronic illnesses in developed countries is about 50% [31]. However, other studies obtained results similar to our study, with a high level of medication adherence or compliance to OAMs (compliance to capecitabine: 91% [32], score of adherence to OAMs: 5.4 ± 1 based on a score ranging from 1 to 6 [33], and adherence to OAMs: >80% [34], 78% [35], and 71–73% [36]). This high adherence to OAMs can be explained in particular by the gravity of the cancer [32]. It is important to note that there is no gold standard for assessing medication adherence and that several measurement tools or strategies are described in the literature; also, medication adherence can be influenced by many cofactors (e.g., psychological distress, perception of illness, concern of adverse effects, self-efficacy in medication management and decision making, knowledge of medication, and social support) [37, 38]. Importantly, the duration of OAM treatment was relatively short (median of 38 weeks), and longer treatment durations may decrease medication adherence [39]. Most of the items concerning quality of life showed a significant link with the MMAS-8, especially the intentional items. We can suppose that an altered HRQoL can be the cause of non-adherence in patients. Indeed, the presence of adverse effects is strongly associated with poorer adherence [40]. However, a pharmacist-led adherence program can increase the proportion of patients adhering to OAMs [41]. Intentional MMAS-8 scores are also weakly correlated to VAS scores assessing the quality of the information provided by oncologists. We presume that good quality information provided by the oncologist to the patient can encourage the latter to better adhere to their treatment.

OAMs prescription and dispensing have changed in France since this study was performed. Multidisciplinary consultation programs involving the oncologist, the hospital pharmacist, and the nurse have been engaged and can decrease the incidence of adverse events [42]. Most importantly, the French regulation of community pharmacy activities has changed (September 30, 2020), with recognition and funding given to the pharmaceutical support of patients on OAMs, aiming "to make the patient autonomous and an actor in their treatment, limit the loss of reference points for these patients, promote monitoring, proper use and compliance with OAMs, inform the patient and obtain adherence for their treatment, help them in the management of treatments, prevent adverse effects, and provide coordinated patient care" [43].

4.1. Study Limitations. A selection bias may be present with more satisfied patients or more unsatisfied ones. Satisfaction scores tended to be higher for patients recruited in pharmacies compared to patients recruited in oncology departments, but the difference was not statistically significant. The use of a VAS score to assess satisfaction which is subjective could be a source of bias, but this has already been used in several medical conditions (hip arthroplasty [44], epilepsy management [45]). It is noteworthy that when assessing patient satisfaction, in comparison to the Likert scale, VAS seems to be less sensitive to bias from confounding factors and a ceiling effect, and the time taken to answer is shorter [46]. Moreover, this assessment of the patient's satisfaction for the quality of the dispensing of OAMs remains a subjective assessment of the work quality of pharmacist. Finally, the small sample size of patients means that the interpretation of the results should be treated with caution, particularly for secondary outcomes.

5. Conclusions

The satisfaction of patients regarding their OAM dispensing by community pharmacists was high, but the provision of information on OAMs by pharmacists remained low in comparison to oncologists, whereas it should be at least at the same level. Moreover, patients' satisfaction was associated with the provision of OAM information during dispensing. The good practices of medication dispensing by pharmacists are an important component of patient care, and we encourage pharmacists to provide more medication information to their patients.

Data Availability

Data will be made available upon request to the corresponding author.

Conflicts of Interest

The authors declare that there are no conflicts of interest regarding the publication of this paper.

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Supplementary Materials

The list of OAMs among the 91 patients analyzed is presented in the supplementary file. (*Supplementary Materials*)

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