

PERSPECTIVE



Patients' and clinicians' knowledge in cancer-related cognitive impairment and its implications: current perspective

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ABSTRACT

Health literacy is essential in cancer care. Low health literacy compromises the capacity to maintain one's health through self-management and collaboration with healthcare providers, especially when facing cognitive side effects related to cancer and its treatments. Cancer-related cognitive impairment (CRCI) is a common phenomenon among cancer patients and might determine a significant impact on their quality of life, yet it is still under identified by both clinicians and patients. This perspective aims to discuss the implications of patients' and healthcare professionals' lack of awareness on the matter and argues about the importance of improving the level of information on CRCI to mitigate difficulties in identifying and managing such manifestations on various levels.

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cancer; cancer-related cognitive impairment; cognition; health literacy; patient education; physician-patient communication; treatment side-effects

1. The role of health literacy in oncology

Health literacy, first introduced in the 1970s by Simonds [1], primarily refers to the ability to acquire, and comprehend fundamental information, enabling individuals to make informed choices [2]. In particular, the concept of health literacy encompasses three main aspects: understanding health, healthcare and health systems; processing and utilizing information in various formats related to health and healthcare; and the capacity to maintain one's health through self-management and collaboration with healthcare providers [3].

Over the last two decades, increasing attention has been devoted to the concept, recognizing its substantial benefits for individual and public health [3]. This has led many countries, including some European Union member States, to prioritize health literacy in their policies and practices [4]. Adequate health literacy is essential for promoting health and preventing diseases, as wellinformed individuals are more likely to adopt healthy behaviors, seek healthcare when necessary and effectively manage their chronic health conditions [5]. This is especially relevant in the oncological field, where patients have compelling needs for support and information [6,7].

Nonetheless, people may have limitations in their health literacy, due to the influence of factors such

as education, language, access to healthcare resources and culture [8]. Consequently, a low level of health literacy can lead to poor decision-making, poor disease management, non-adherence to prescribed therapies and worsening health conditions [9]. Individuals with lower health literacy face greater difficulties processing information, report poorer psychological outcomes and experience a lower quality of life, while those with higher health literacy appear better informed and able to take on a more active role in managing their health [10]. Such consequences are particularly evident among individuals with lower educational attainment and constrained financial and social means [8,11]. Furthermore, individuals with lower health literacy are at higher risk of encountering adverse health consequences, including difficulties in comprehending health-related information and making informed choices, ultimately affecting their overall wellbeing [12]. On the other hand, personal characteristics, such as emotional and cognitive impact of cancer, sociodemographic and clinical factors and the oncological diagnosis may influence information processing and understanding of cancer-related information [13].

Stressful situations, such as receiving an oncological diagnosis, can impair the ability to understand and use health information effectively [6,14]. At a time of crisis, as is the moment of a cancer diagnosis, patients and

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their family members need to be able to understand all the information related to the diagnostic process, the characteristics of treatments, the alternative options, the expected physical and psychological side effects, their prognosis and also to understand how all of these elements are going to impact their everyday life, their relationships and their roles [6]. Research has shown that patients need support from physicians and caregivers, they need to access reliable and comprehensible information and they need to take part in the decision-making process [15,16].

The present work aims to draw attention to the topic of health literacy in cancer care and to discuss it within the recent available literature, especially regarding cancer-related cognitive impairment (CRCI) and to explore the implications of increasing patients' and healthcare professionals' awareness of the matter. Through the present article, we argue that acknowledging and managing these cognitive correlates could start by addressing health literacy skills on various levels (patients and caregivers, society, policies), with the final aim of empowering patients in their cancer journey.

2. Cognitive dysfunction & cancer

In cancer care, health literacy plays a fundamental role, not only concerning the signs and symptoms of illness, but also the side effects of treatments. Despite being widespread and determining a significant physical and psychosocial burden, these disturbances are often underrecognized by healthcare professionals and by patients and their social context [17,18].

Globally, the incidence of cancer has increased due to the gradual aging of the population and due to the greater promotion of specific screening examinations [19]. The improvements in cancer detection and treatment efficacy, however, have led to an unprecedented number of cancer survivors with various clinical consequences, including debilitating treatment-related side effects, such as mood and cognitive alterations, among others [20]. A multitude of factors (e.g. neurobiological and genetic) and treatments (e.g. chemotherapy, immunotherapies, endocrine therapies, radiation therapies and surgery) seem to be associated with the onset of cognitive alterations in individuals with non-central nervous system (non-CNS) tumors [21-23]. However, cognitive changes have been observed in cancer patients even before the start of treatments, suggesting that tumor biology by itself can affect cognition inducing neuro-behavioral changes [24]. Additionally, imaging studies on cancer patients confirmed the presence of brain changes associated with cognitive dysfunctions [21,25-29]. These cognitive changes are detectable over years after the end of the treatment [30], and, in some cases, they become progressive [24], possibly explaining the long-term cognitive difficulties experienced by some patients [31]. Despite increasing research on the consequences of cancers and the associated treatments on patients, the mechanisms related to brain changes and their association with cognitive performance remain largely unknown [23]. Originally, these cognitive dysfunctions were called 'chemobrain' or 'chemofog' due to the frequency of manifestation during the chemotherapy treatment [32,33]. However, considering the heterogeneity of mechanisms and factors, cognitive dysfunctions associated with cancer and cancer treatments have been redefined as "cancer-related cognitive impairment" (CRCI). It is characterized by mental cloudiness and weakening cognitive abilities, reaction times and organizational skills [32]. In particular, CRCI involves multiple cognitive domains, including learning and memory, attention, executive functions and information processing speed [20,34]. It can also have a detrimental effect on multitasking, generating stress and weakening performance in tasks involving higher cognitive functions, such as the acquisition of new skills [32]. To facilitate an unequivocal identification of the CRCI, the International Cancer Cognition Task Force (ICCTF) [35] recently recommended criteria for the classification of cognitive impairment [i.e., two test scores \leq 1.5 standard deviations from the normative mean, or one test score < 2.0 standard deviations from the normative mean and comparison of the scores with probability curves]. However, the neuropsychological assessment is made difficult by the great heterogeneity in cognitive tests and by the lack of normative data from the oncology population [36,37]. In fact, CRCI involves patients across various non-CNS solid tumors and hematological cancers [22], affecting up to 75% of cancer patients during active treatment and approximately 35% of survivors after treatment completion [20,34,38]. CRCI symptoms can fluctuate, ranging from mild mental cloudiness to marked cognitive difficulties [20]. Moreover, the severity of the onset of cognitive difficulties also varies according to premorbid cognitive performance [23]. Indeed, there is less evidence of worsening in high-performance patients, as performance may remain within normative ranges [23]. In these situations, caregivers and healthcare providers may overlook deficits concerning usual functioning, paying little attention to these important signs. However, at this stage, it is important to place great emphasis on the patient's feelings regarding their cognitive performance, as they may be a preliminary sign of a possible impairment [20,39,40]. Notably, compared with the healthy population, cancer patients exhibit a higher prevalence of subjective cognitive difficulties, reporting cognitive complaints as one of the major side effects [34]. An example is given by Joly and colleagues [41] who conducted a survey on 1600 survivors years after the end of cancer treatment and found that 75% of participants self-reported cognitive symptoms and the majority of them (72%) wished to receive support and would have been interested in participating in cognitive rehabilitation sessions. However, these symptoms may go beyond the immediate cognitive implications and harm one's emotional and social well-being, interfering with personal and work-related responsibilities and worsening quality of life [7,21,42,43]. Cognitive dysfunctions may also limit functional independence and even interfere with medical decision-making during the care process, reducing adherence to cancer treatments [44].

On top of the factors already mentioned, other variables regarding the psychological and sociodemographic domains can be involved in the manifestation of CRCI [21]. In particular, psychosocial factors such as anxiety and depression have been frequently reported by cancer patients and are associated with CRCI [7,21]. The interactions between CRCI and emotional distress are complex and need additional investigation [21], nevertheless, both cancer survivors and healthcare professionals describe psychosocial aspects as being a significant part of the impact of CRCI on patients' lives [7]. Such distress appears to be determined by various subjective psychological experiences, namely concern and confusion regarding cognitive symptoms, loss of confidence in one's own abilities or efficacy, frustration and decreased tolerance for distress, sense of loss of habitual functioning and difficulties in social interactions [7]. At the same time, high emotional distress might negatively impact patients' cognitive functioning [6,14].

The complexity of CRCI itself and the nature of the cognitive alterations in cancer patients, in addition to the heterogeneous factors that interact with them, determine an extremely articulated and variable picture, which is difficult to describe and synthesize [22]. Research on this topic is progressively growing over the recent years [21]; however, the complicated features of cognitive problems in cancer patients represent a partial explanation of the knowledge gaps that exist and a potential obstacle in the attempt to overcome them.

3. Health literacy & cancer-related cognitive impairment

Several authors have investigated patients' ability to recognize and identify psychosocial distress and other manifestations such as symptoms of depression, anxiety and cognitive disturbances following chemotherapy [17,45,46]. In a study by Cheung and colleagues [17], more than half of cancer patients with significant cognitive disturbances could not correctly identify the associated symptoms when completing a mental health literacy guestionnaire. The authors explained this lack of recognition of cognitive impairment as a consequence of unfamiliarity with cognitive symptoms associated with treatments [17]. Patients and healthcare providers who have low literacy in the domain of cognitive functioning might not be aware of symptoms and fail to realize that they need to be taken into consideration and adequately managed [17,46,47]. Thus, access to assessment and treatment of such manifestations can be delayed or hindered, leading to suboptimal patient administration [46]. In a cross-sectional cohort study on Australian cancer service users [13], participants reported difficulty finding information on maintaining or managing their mental health and coping with the side effects of cancer treatments. Respondents felt that they did not have sufficient information on what to expect or how they would feel during the administration of therapies. Another study reported that many cancer survivors, during their treatment journey, recognized the need to receive adequate information about CRCI and, in cases where they had been provided with information, they often were not able to remember it [7]. At the same time, oncology healthcare professionals perceive CRCI as a significant burden on individuals' professional and personal lives, however they encounter several barriers to the possibility of addressing the issue, such as the lack of appropriate assessment tools [48]. As a consequence of these barriers, healthcare professionals tend to deliver only general advice on symptom management to their patients and are less likely to make referrals to other specialists [48]. Along a similar line, a study by He and colleagues [49] explored Australian oncology healthcare professionals' knowledge and perceptions regarding CRCI. The authors found that wider knowledge and broader clinical expertise on cognitive symptoms in oncology healthcare professionals was associated with a higher tendency to address the issue with their patients [49]. However, a discrepancy emerged, highlighting a general difficulty of healthcare professionals in applying their knowledge on CRCI and management strategies in their clinical practice. Many of them explained their reluctance to initiate discussion with patients with the limited information that still exists on the etiology and mechanisms implied in such manifestations [49].

It is important to note that patients' possibility of accessing relevant information about their disease, treatment and characteristics of the healthcare system also allows them to actively participate in the process of care [12,39]. Shared decision-making and patient participation are central to patient-centered care [40-42] and conversely, sharing information and promoting health literacy in patients is a necessary step for personalized care planning and treatment tailoring [6,43,44]. At the same time, receiving a cancer diagnosis or enduring oncological treatments, due to the psychological strain they produce, have the power to impair the ability to understand and effectively use the health information available [45]. Patients have to deal with many new challenges at a highly emotional time [46,47]. Patients and their caregivers are called to engage in several health literacy skills, such as oral and written language abilities, numeracy, communication, decision-making and navigation of the complexity of the healthcare system [48]. This becomes particularly relevant in the oncological context, where patients need to use such abilities to make critical decisions about a potentially life-threatening disease, often under the pressure of time, taking into account multiple options about treatments with complicated regimens or different side effects [45]. In addition, cancer patients and their caregivers are often searching for reassuring information and they might be especially vulnerable to misleading and untrustworthy sources concerning health and treatments [6]. This has become particularly relevant in recent times because, with the increasing use of the internet, people are more exposed than ever to inaccurate, non-scientific, or even false health-related information [6,49].

In addition to the emotional aspects affecting the processing of information, symptoms of cancer or treatment side effects such as CRCI, pain, or fatigue can impair attention and memory and consequently affect how people comprehend and recall cancer information [12]. It is known that recall of cancer-related information is often compromised [47,50]. This is especially noteworthy considering that cancer is increasingly being treated as a chronic illness and, as such, it requires constant effort in self-management by patients and their caregivers [44,46,51]. Ultimately, access to information about health and treatments is crucial for a variety of measures concerning patient outcomes and overall, it affects the effectiveness of cancer care [39,46]. In brief, the longterm self-management of the disease, the complexity of healthcare systems, the multiplicity of treatment options and especially coping with adverse effects of cancer therapies, together with the other factors described, make health literacy a critical factor in patient care [44].

4. Clinical implications of cognitive symptoms recognition & awareness

Accessing comprehensive information about the possible adverse effects that the disease and associated therapies

may cause is of paramount importance for oncological patients [50]. Increasing knowledge on these aspects allows the patients to be fully aware of their clinical course and correctly informed about the possible consequences of their medical condition and treatments [50]. In addition, despite the growing interest in the field of cognition in non-CNS tumors, limitations persist in the diagnosis and management of CRCI [23,24]. Many promising treatment protocols and preventive approaches for the management of neuro-cognitive changes have been developed in recent years, although further research on their effectiveness and implementation is needed to integrate them into standard oncological care [18,51–53].

In addition to the issues concerning the informative content to convey to patients, particular attention must be paid to communicating it adequately and effectively. Indeed, several studies have shown that it might not be sufficient to simply inform patients about the association between cognitive problems and cancer or cancer therapies, as it can worsen subjective cognitive complaints and objective cognitive performance [46,54-56]. Such adverse effects of information [57] might be determined by a nocebo effect, which happens when negative expectations on symptoms or side effects trigger the exacerbation of these manifestations [57– 60]. Other relevant mechanisms implied in adverse effects of information, identified by Jacobs et al. in their recent work [56,57], might be stereotype threat [61] and stigma consciousness [62]. They are constructs derived from social psychology that pertain to the threatening effect of stereotypes on individuals' identity [56] and that have been investigated as potentially applicable to cancer patients as well [56]. After a cancer diagnosis, being informed about CRCI might negatively impact the patients' perceptions of their own identity and capacities [56,57], inducing a feeling of being 'weak' or an identification with the stereotypical "patient role" [63]. As a consequence, healthcare professionals should consider the possibility of adverse effects of information when communicating with patients about the possible occurrence of cognitive impairment.

Effective strategies might include adopting psychological interventions such as self-affirmation exercises [56] or educating patients about the nocebo effect [60], even though the latter has been tested only for noncognitive side effects of treatments. Given the relevance of stereotype threat in this phenomenon [56], it might be also important for clinicians to personalize the communication according to the needs and preferences of each patient and to involve them in a process of shared decision-making [64], avoiding generalizations and impersonal statements. Indeed, effective communication between patients and healthcare profession-



als can modulate psychological distress and increase the patient's motivation and health-related quality of life [57,65].

5. Implementing new strategies for improving health literacy & CRCI clinical management

The present article suggests that the lack of information about the possible adverse cognitive effects of cancer and oncological treatments might determine poor literacy and knowledge on the matter, both for patients and healthcare providers. This inhibits cancer survivors' ability to prepare for and deal with cognitive impairments and to understand how they may affect activities of daily living [42] and the clinicians' capacity to guide them in their management and treatment [47].

As Liu and colleagues underlined, the definition of health literacy encompasses different dimensions [3], that can be articulated on various levels, such as the individual level of patients and caregivers, the level of healthcare providers and society in general and the broader level of healthcare systems. Numerous unresolved issues emerged in the present article, highlighting the gaps that are still present in the information available on CRCI. Many questions remain on how to fill these gaps and how to help patients and especially those with lower health literacy, get the best possible care in their cancer journey, taking into consideration their cognitive functioning as well. Critically outlining such questions along the different identified levels may stimulate considerations of the different aspects addressed in this article and encourage greater awareness of the efforts needed. Specifically, on the patients and caregivers' level, great emphasis should be placed on the involvement of cancer patients with cognitive impairments and their families through psychoeducational interventions, aimed at enhancing patients' and caregivers' knowledge about the necessary skills for taking care of their own or their loved ones' health and managing the daily difficulties [66]. Indeed, patients and their carers are interested in receiving reliable information to improve their health literacy and be more aware of important clinical manifestations [6,15] and their informational needs should be adequately assessed and fulfilled [48,67].

Tools that allow a comprehensive assessment of patients' needs, specifically regarding CRCI, do not yet exist [7]. Psychoeducation in this domain should be thought of as a way to inform patients on the characteristics and nature of CRCI and to propose compensatory strategies to use in everyday situations [68]. The approach of focusing more on informing patients and caregivers is fundamental to improve awareness for those with lower health literacy, to allow real shared decision-making [6,15]

and to reduce the occurrence of caregiver burden, which is known to be less frequent for people who know how to take action and have a perception of control in a difficult situation involving their relatives [69].

Regarding the healthcare providers' level, since patients have the right to be informed about medical procedures and their possible side effects [56], it becomes crucial to consider the content and the characteristics of such communications. The importance of identifying the optimal communication strategies to ensure the best clinical experience for the patient and to avoid adverse effects of information has already been described previously [56,57,70]. Indeed, the literature revealed that healthcare professionals themselves need educational interventions to deal with CRCI and with their patients [36,47]. In fact, in some cases, patients who are concerned about their cognitive functions might decide to refer to their oncologists and could find out that their physicians also struggle with the diagnosis and management of cognitive dysfunction [47,49]. It is particularly important to spread awareness of these side effects within clinical practice, to inform healthcare professionals and to encourage the adoption of personalized communication strategies that can involve the patient within the care pathway [64,71,72]. Additionally, deeper knowledge of CRCI and its multi-dimensional nature might help clinicians identify adequate referral pathways [48]. Information for healthcare professionals might come from expert groups such as the ICCTF, as their goal is to increase the comprehension of cognitive impairment in cancer and to serve as a resource for up-to-date information about research and clinical data. Patient associations are also a valuable source of information, as they help disseminate knowledge and serve as advocates for patients' experiences [68].

Another relevant aspect concerns the assessment of patients' subjective experience of their cognitive functioning. Providing specific self-report instruments for the identification of cognitive impairments in cancer [i.e., Functional Assessment of Cancer Therapy-Cognition; [73]] would help healthcare professionals to monitor symptomatology that may not be evident through neuropsychological assessment and would guide them toward the need for an in-depth evaluation.

To address these shortcomings in clinical practice it is also necessary to identify the healthcare professionals involved in the management of the CRCI [36]. The creation of multidisciplinary teams based on a shared consensus on which professionals should be involved is a crucial aspect, as multidisciplinarity enables a comprehensive and tailored approach for addressing patients' needs [36,68]. The contribution of a neuropsychologist



Table 1. The table summarizes actionable recommendations to enhance health literacy in relation to CRCI and improve its clinical management, across different levels, namely: cancer patients and their caregivers, healthcare providers, society and public authorities.

Level	Recommendations
Patients and caregivers	- to enhance knowledge about cognitive impairments and necessary compensation strategies and skills through
	psychoeducational interventions
	 to ensure that patients and caregivers access accurate and reliable information about CRCI to improve health literacy and awareness of symptoms
	- to assess informational needs of patients and caregivers
	- to involve caregivers in psychoeducational and supportive interventions
	- to develop comprehensive tools to assess patients' cognitive functioning
Providers	 to provide training and educational interventions for healthcare professionals regarding CRCI management and communication strategies
	- to encourage tailored communication methods to engage patients, paying particular attention to those with lower healtl literacy
	- to cooperate with patient associations and expert groups
	- to establish clear referral pathways for cognitive assessments and CRCI clinical management
	- to create of multidisciplinary teams comprising neuropsychologists and other healthcare professionals
	- to conduct adequate screening evaluations and comprehensive assessments of cognitive functions in cancer patients, including the use of self-report measures
System	- to implement initiatives and dissemination campaigns to raise awareness about CRCI among the general public
	- to integrate CRCI into national and international research projects, to increase knowledge on the matter and test new methodologies
	- to include cognitive functioning into national and international cancer control programs
	- to advocate for policies that include CRCI screening and neuropsychological assessments in standard clinical practice - to include CRCI into the discussion regarding organization and financing of cancer care

is essential since it is the professional figure specifically trained to understand the relationships between the brain and behavior through the assessment of cognitive and behavioral functioning. Neuropsychologists are also specifically taught how to adequately inform patients about the development and impact of cognitive dysfunctions and respond to patients' doubts and concerns.

Adopting these proposed measures would hopefully facilitate early detection of the onset of CRCI and, as a consequence, timely access to a targeted cognitive assessment and rehabilitation, if necessary.

At the societal level, more widely, public authorities should create dissemination campaigns, promoting health literacy related to CRCI through initiatives aimed at raising awareness among the general public. Moreover, the topic of CRCI should be integrated into international research projects, bringing together the various stakeholders to share their knowledge and to create and test new methodologies [68]. In response to these difficulties, a 'European Consortium of Cancer and Cognition' was created with the task of identifying methodologies and innovative approaches for the management of CRCI in Europe [36]. It identified several recommendations to be implemented to improve the clinical management of cancer patients with cognitive difficulties [36]. Such recommendations include making CRCI a priority in multidisciplinary national and international cancer control programs. It became evident that including its screening in standard practice is now necessary and the development of strategies to detect and manage CRCI should be supported by European Health Authorities [74]. Authorities and policymakers should integrate the topic of cognitive impairments into the discussion regarding organization and financing of cancer care, as neuropsychological assessments and interventions are not always reimbursed. To this end, some European States are activating projects and initiatives aimed at improving awareness of CRCI, such as the IPAAC program [68], while in some countries no systematic policies have been already identified (i.e., Italy) [36]. However, these initiatives are excellent starting points for the improvement of health literacy and the management of CRCI in cancer patients, but they are still at a preliminary stage. The actionable recommendations and strategies described in the present paragraph are summarized in Table 1.

6. Conclusion

In recent years, clinical attention and scientific exploration have progressively grown, both on the topic of health literacy and CRCI. CRCI is commonly found in non-CNS cancer patients and a multitude of factors is associated with its onset and manifestations, including neurobiological factors, treatment characteristics, sociodemographic variables and psychosocial distress. CRCI can manifest in acute phases, but also in the long term and limit patients' independence in daily activities, impacting their quality of life and well-being. Research has shown that patients have compelling needs for support and information regarding cognitive dysfunctions from healthcare professionals, to be able to understand and manage such symptoms effectively. At the same time, clinicians working in oncology recognize the significant burden that CRCI represents for their patients, although



they often find obstacles in applying what they know to clinical practice. Among those obstacles are the complex nature of CRCI itself, and the need to master effective ways of communicating relevant information to their patients. As a consequence, numerous unresolved issues remain in this field and strategies need to be implemented at different levels. These should include psychoeducational interventions and adequate assessment of patients, multidisciplinary clinical management, implementation of recommendations and guidelines and activation of national and international initiatives on CRCI.

7. Future perspective

In the near future, important steps need to be taken. Cognitive screening of non-CNS cancer patients should be integrated into standard oncological practice, as part of routine symptom evaluation. To facilitate this process, neuropsychological tests to assess cognitive performance should be validated in non-CNS cancer population, alongside tools that allow a comprehensive evaluation of patients' and caregivers' needs in relation to CRCI [7]. Clinical management will need to follow standardized methodologies and guidelines based on a wide body of research on effective rehabilitation protocols, interventions and therapeutic approaches [18]. Ideally, computerized methods will also be tested to make cognitive rehabilitation accessible for as many patients as possible. Additionally, oncology healthcare professionals' awareness of CRCI will be increased through dissemination activities and national and international surveys, as it is already happening in certain contexts [36]. Formal education on the topic should be included in training programs of healthcare professionals working in oncology and interdisciplinary cooperation should be promoted in clinical practice [36,49].

Article highlights

The concept of health literacy

· Health literacy refers to the ability to acquire, process and comprehend fundamental health information, enabling individuals to make informed choices. This concept encompasses the understanding of health, healthcare and health systems, the ability to process and comprehend clinical information and the capacity to maintain one's health through self-management and collaboration with healthcare providers.

Cancer-related cognitive impairment

 Cognitive dysfunctions, emerging as a consequence of therapies or cancer itself, can limit functional independence and have a detrimental effect on patients' quality of life. In addition, CRCI might even interfere with their ability to understand and remember health-related information, hindering patients' participation in the decision-making process and reducing adherence to cancer treatments.

Health literacy of patients & healthcare professionals regarding CRCI

• Low health literacy on side effects in oncology, such as CRCI, can lead to an underrecognition of the clinical symptoms from the

perspective of both patients and physicians. Additional consequences involve a limited participation in clinical decision-making, poor disease management, reduced adherence to prescribed therapies, worse physical and psychological health and a lower quality of life.

Gaps & future perspectives

• The present perspective highlights the gaps that are still present in the knowledge of patients and healthcare providers related to CRCI. Future efforts should be directed to encourage the involvement of cancer patients and their caregivers, to enhance practitioners' knowledge to identify and manage CRCI and their communication strategies. Furthermore, specific guidelines should promote health literacy on CRCI and include its assessment in the standard process of care.

Author contributions

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