What quality of information is found on the Brazilian internet about breast and prostate cancer treatment?

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Resumen

Introducción: Internet es una herramienta de consulta de información sobre salud, concretamente sobre enfermedades, síntomas y tratamientos, como el cáncer. Diferentes tecnologías digitales, como websites, proporcionan contenidos instantáneos sobre salud. Objetivo: Evaluar la calidad de información sobre tratamiento del cáncer de mama y de próstata en websites brasileños. Método: Estudio epidemiológico analítico transversal. Se seleccionaron websites, verificando los criterios de inclusión y exclusión Para el análisis se utilizaron dos herramientas: evaluación global de la información y otra para evaluar la calidad de la información específica sobre tratamiento del cáncer. Resultados: Sobre cáncer de mama, tanto en la dimensión de contenido como técnica la calidad fue mala, mientras que en la dimensión de tratamiento fue muy mala. En websites relacionados con cáncer de próstata, predominó mala calidad en las tres dimensiones. Complicaciones relacionadas con tratamiento de ambos tipos de cáncer estaban presentes en 14% de los websites. Sobre cáncer de próstata, 66% utilizaba jerga o palabras técnicas y 2% informaba sobre eliminación de los fármacos de quimioterapia. Conclusión: Así, información sobre tratamiento del cáncer de mama y de próstata en websites brasileños es de baja calidad y puede causar daño a los pacientes que buscan este tipo de información en internet.

Palavras claves: Servicios de información; Internet; Cáncer de Mama; Cáncer de Próstata.

Abstract

Introduction: Internet become an instrument to search for health information, as diseases, symptoms and treatments, like cancer. Thus, different digital technologies, like websites, provide instantaneous health-related content. Objective: The study aimed to evaluate the quality of information about breast and prostate cancer treatment on Brazilian websites. Method: This is a cross-sectional analytical epidemiological study. Websites were selected, verifying the inclusion and exclusion criteria. Two tools were used for analysis: global evaluation of the information and another to evaluate the quality of the specific information on cancer Result: In websites related to breast cancer, both in the content and technical dimensions, the quality was poor, while for the treatment dimension, the quality very poor. In the websites related to prostate cancer treatment, poor quality was predominant in the three dimensions evaluated. Treatment-related complications for both types of cancer were present in 14% of the websites. Of the websites about prostate cancer, 66% used jargon or technical words, and 2% informed about the disposal of chemotherapy drugs. Conclusion: Therefore, it was observed that information about breast and prostate cancer treatment on Brazilian websites is of low quality, which can cause harm to patients who seek this type of information on the internet.

Keywords: Information Services; Internet; Breast Neoplasms; Prostatic Neoplasms.

What quality of information is found on the Brazilian internet about breast and prostate cancer treatment?

Cancer is characterized by the proliferation of cells that have managed to escape the central endogenous control mechanisms. There are many types of cancer and the most frequent in women and men are breast and prostate cancer, respectively. Due to its diversity of treatment, the Internet has established itself in modern society as a tool for the dissemination and acquisition of health information. However, it should be noted that in the digital environment, information is not always of good quality and correct.

INTRODUCTION

According to the International Agency for Research on Cancer associated with the World Health Organization (WHO), in 2020, about 19.3 million people worldwide were living with cancer. It is worth mentioning that WHO estimates that in 2040, 30.2 million people may have some type of the disease1. In Brazil, according to the Global Cancer Observatory (OGC) report, in 2020 there were 592,212 new cases, 16.4% of which were prostate cancer and 14.9% breast cancer[2].

Breast cancer presents a hundred times more cases in women than in men[3]. The diagnosis can be made through self-examination or routine examinations that should be performed annually, as recommended by the International Gynecological Cancer Society[4].

Prostate cancer is the second most common malignant cancer affecting men, second only to lung cancer[5]. The prostate enlargement may cause obstruction of the urethra, reducing the urinary flow, promoting urinary retention and difficulty to start and stop urination[6]. The diagnosis is made with the support of some tests, the main ones being the blood test for prostate-specific antigen (PSA) and the rectal examination[7].

In the context of treatment, the most commonly used for both types of cancer are surgery, radiotherapy, hormone therapy, chemotherapy, immunotherapy, and active surveillance[8,9]. The choice of treatment is made by analyzing each case individually, taking into account the tumor stage, age, symptoms, and comorbidities that the patient has[10].

Upon diagnosis and confirmation of the cancer, the patient is surrounded by questions and information that can confuse and complicate the treatment process. Thus, they use alternative resources to professional counseling, such as the Internet, to quickly obtain information about signs, symptoms, and treatments that can later be confirmed or not with the health care professional who is assisting them[11].

With the development, modernization, and connection of digital technologies such as websites and social media, these have become widely used tools in the search for health information[12]. However, it is explicit that, because there is no control or regulation of what is found on the networks, the content about health can be incomplete, sometimes incorrect, and unreliable[13]. Thus, tools were created based on criteria and indicators to evaluate the quality of health information on the Internet, such as the HONcode, the Discern Questionnaire, and the AMA Guideline[14].

In Brazil, the study by Mendonça and Neto (2015) proposed some criteria for evaluating the quality of information found on Brazilian health websites, based on international instruments. The tool proposed in the study is based on the use of three distinct dimensions - content, technique, and design[15]. For example, Neto and collaborators (2017) adapted the tool to evaluate the quality of Brazilian websites about dengue and observed that 70% were not in accordance with the quality criteria[16].

As cancer is a multifactorial disease and is related, by the general population, to a negative prognosis with various problems associated with chemotherapy, it is to be expected that patients with a confirmed diagnosis, as well as their families, seek information through various vehicles of information and not just through health professionals. In this sense, the internet stands out as a source of search for health information, considering that access to websites is currently in the palm of the hands through “smartphones”[11]. Therefore, it is necessary to evaluate the quality of information on breast and prostate cancer treatment on Brazilian websites.

METHODS

This is a cross-sectional analytical epidemiological study that was based on the analysis of the quality of information on Brazilian websites that provide information regarding the treatment of breast and prostate cancer.

Two tools were used to evaluate the websites, namely: Assessment of the quality of global health information on websites" (QIG) and "Assessment of the quality of specific information on cancer treatment" (QIC).

The first (QIG) was adapted from the tool described by Mendonça and Neto (2015)[15], which is divided into three dimensions: content that encompasses the scope, accuracy and intelligibility of the disclosed data; technique which involves the criteria for guaranteeing the credibility, security and privacy of the information of the individuals who access it, representing their level of transparency; and design, which considers usability and accessibility criteria for users, involving layout features¸ navigation, speed, compatibility with browsers, in addition to guaranteeing easy access for people with some type of disability.

The QIG tool used in the present study was adapted, after consensus among the authors, considering the technical capacity of health professionals to analyze the websites. This adaptation occurred through the elimination of some criteria and indicators of the original tool, such as the design dimension, judged with a certain degree of difficulty for analysis by professionals who are not in the area of technology and information, in addition to the sentences not being relevant to the objective of the study.

The second instrument (QIC) for assessing the quality of specific information about cancer treatment was developed for this study, as no tool for this purpose was found in the literature. For this, the Delphi method was performed. Initially, the instrument was elaborated based on the information contained in clinical protocols that guide the treatment of both types of tumors. Subsequently, this tool was sent to 20 specialists in the field of cancer. The Delphi method is an investigation technique that groups the opinions of experts, generating results that serve to better understand a certain phenomenon and guide decision-making. The method has three essential components: the anonymity of the experts, statistical analysis of the results and the feedback of the results of the answers to the experts.

The minimum requirements for the selection of professionals were: to have at least one specialization and experience in activities related to cancer treatment. The invitation to the specialists was carried out by e-mail. The email addresses of the guests were obtained through the contact network of the authors of this study. The emails sent contained a link that gave access to the Google Forms page, where the specialist confirmed participation through the Informed Consent Form (TCLE) and answered the form with the sentences on the subject of the study. This study was approved by the Ethics Committee of the institution under registration CAAE 12134919.0.0000.5243.

The evaluated websites were selected using the search tools Google (http://www.google.com.br) and Yahoo (http://www.yahoo.com.br), applying the following filters: "Advanced Search" mode ", option "pages in Portuguese" and country "Brazil".

Two searches were performed for each type of cancer in each search engine with the following combinations of words and Boolean operators: "câncer de próstata AND medicamentos OR remédios" and "tratamento câncer de próstata" and "câncer de mama AND medicamentos OR remédios" and "tratamento câncer de mama . Searches were carried out only in Brazilian Portuguese, as the objective was to analyze only Brazilian websites.

The first 75 Uniform Resource Locator (URL) obtained from each search (two searches on Google and two on Yahoo) were collected, making a total of 300 URLs. After excluding duplicates, the first URL of each search was selected to form a list of 50 websites for analysis. To minimize possible influence on the results by personalized search, the entire period of navigation data was cleaned.

Excluded from the study were websites that redirected to files in ".pdf" (Adobe Acrobat) and ".doc" or ".docx" (Microsoft Word) formats, weblogs, those whose content was not related to the treatment of breast cancer or prostate and websites with access problems.

To assess the final quality of the information contained on the websites, the QIG and QIC tools were used, containing 31 and 26 sentences, respectively. Considering the evaluation reference established by Charnock *et al.* (1999), each question on the forms could have three response options: (0) for absence of a certain item; (1) partial presence of a certain item and (2) total presence of the assessed item[17]. It should be noted that some judgments could also be imputed "NA"

= not applicable due to the non-possibility of partial presence of the judged item. The quality of the websites was determined by the final score converted into a percentage: 75 %≤ ∑≤ 100% indicates good quality; 50≤ ∑ ≤ 74% regular quality; 25≤ ∑ ≤ 49% poor quality and 0≤ ∑≤ 24% very poor quality.

RESULTS

With the construction of the QIG tool, analyzes were made of the quality of the global information of the websites referring to breast and prostate cancer, based on the content and technical dimensions. In the content dimension, it was observed that 56% and 62% of the websites contained full information on treatment possibilities for breast and prostate cancer, respectively. Only 14% of the websites made reference to possible treatment complications for both cancers. Treatment benefits were reported on 4% of breast cancer websites and 40% of prostate cancer websites. In 52% and 74% of websites for breast and prostate cancer, respectively, it was not stated whether the analyzed content was scientifically based. It is noteworthy that 66% of websites about prostate cancer used jargon or technical words (Table 1).

Table 1. Assessment of the quality of global information on the websites referring to the content dimension of the QIG instrument.

QIG	CONTENT					
QUESTIONS	BREAST *n*=50			PROSTATE *n*=50		
	Total presence (2)	Partial presence (1)	Absence (0)	Total presence (2)	Partial presence (1)	Absence (0)
1. Does the website present diagnostic information?	48% (*n*=24)	16% (*n*=8)	36% (*n*=18)	40% (*n*=20)	58% (*n*=29)	2% (*n*=1)
2. Does the website present information about treatment possibilities (chemotherapy, radiotherapy, hormone therapy, surgery)?	56% (*n*=28)	36% (*n*=18)	8% (*n*=4)	62% (*n*=31)	38% (*n*=19)	0% (*n*=0)
3. Does the website present information about possible treatment complications?	14% (*n*=7)	12% (*n*=6)	74% (*n*=37)	14% (*n*=7)	52% (*n*=26)	34% (*n*=17)
4. Does the website present the benefits and performance of treatments and/or products?	4% (*n*=2)	18% (*n*=9)	78% (*n*=39)	40% (*n*=20)	8% (*n*=4)	52% (*n*=26)
5. Does the website have contact details for more information about diagnosis, treatment and prevention?	16% (*n*=8)	2% (*n*=1)	82% (*n*=41)	14% (*n*=7)	0% (*n*=0)	86% (*n*=43)
6. Is the content scientifically based on studies, research, protocols, consensus or clinical practice?	48% (*n*=24)	N/A	52% (*n*=26)	26% (*n*=13)	N/A	74% (*n*=37)
7. Does the website present the sources that support the available information?	26% (*n*=13)	N/A	74% (*n*=37)	26% (*n*=13)	N/A	74% (*n*=37)
8. Are the sources widely recognized and reputable?	30% (*n*=15)	N/A	70% (*n*=35)	20% (*n*=10)	N/A	80% (*n*=40)
9. Is the language appropriate for the target audience?	82% (*n*=41)	18% (*n*=9)	0% (*n*=0)	84% (*n*=42)	0% (*n*=0)	16% (*n*=8)
10. Does the website use technical words or jargon unfamiliar to the general public?	2% (*n*=1)	24% (*n*=12)	74% (*n*=37)	66% (*n*=33)	0% (*n*=0)	34% (*n*=17)

Regarding the technical dimension of the QIG tool, 56% and 8% of the websites for breast cancer and 26% and 24% for prostate cancer contained information about the person in charge and date of update, respectively. Only prostate cancer websites (54%) mentioned the audience for whom the information is intended. Certification was present in 8% and 22% of websites about breast cancer and prostate cancer, respectively. Information regarding the importance of medical consultation for patient follow-up was predominant on websites related to prostate cancer (80%) when compared to breast cancer (28%) (Table 2).

Table 2. Evaluation of the quality of the global information on the websites referring to the technical dimension of the QIG instrument.

QIG						
	TECHNICAL					
QUESTIONS	BREAST *n*=50			PROSTATE *n*=50		
	Total presence (2)	Partial presence (1)	Absence (0)	Total presence (2)	Partial presence (1)	Absence (0)
1. Is there the author of the information?	50% (*n*=25)	0% (*n*=0)	50% (*n*=25)	44% (*n*=22)	0% (*n*=0)	56% (*n*=28)
2. Were the authors' credentials provided?	18% (*n*=9)	2% (*n*=1)	80% (*n*=40)	28% (*n*=14)	0% (*n*=0)	72% (*n*=36)
3. Does the website provide contact addresses for the author?	4% (*n*=2)	N/A	96% (*n*=48)	12% (*n*=6)	N/A	88% (*n*=44)
4. Is there information about the person responsible for the website?	56% (*n*=28)	N/A	44% (*n*=22)	26% (*n*=7)	N/A	74% (*n*=37)
5. Were the credentials of those responsible provided?	30% (*n*=15)	4% (*n*=2)	66% (*n*=33)	16% (*n*=8)	0% (*n*=0)	84% (*n*=42)
6. Is there the date of creation of the website?	4% (*n*=2)	N/A	96% (*n*=48)	20% (*n*=10)	N/A	80% (*n*=40)
7. Is the website updated date?	8% (*n*=4)	N/A	92% (*n*=46)	24% (*n*=12)	N/A	76% (*n*=38)
8. Does the content creation date appear?	22% (*n*=11)	N/A	78% (*n*=39)	26% (*n*=13)	N/A	74% (*n*=37)
9. Does the update date appear on all pages/contents on the site?	32% (*n*=16)	N/A	68% (*n*=34)	20% (*n*=13)	N/A	80% (*n*=40)
10. Is the purpose of the website clear?	70% (*n*=35)	26% (*n*=13)	4% (*n*=2)	90% (*n*=45)	0% (*n*=0)	10% (*n*=5)
11. Does the website mention the audience for which the information is intended?	0% (*n*=0)	N/A	100% (*n*=50)	54% (*n*=27)	N/A	46% (*n*=23)
12. Is the website certified by any accrediting institution?	8% (*n*=4)	N/A	92% (*n*=46)	22% (*n*=11)	N/A	78% (*n*=39)
13. Is financial support and partnership mentioned?	12% (*n*=6)	N/A	88% (*n*=44)	18% (*n*=9)	N/A	82% (*n*=41)
14. Are advertisements clearly identified/Do you have advertisements?	66% (*n*=33)	N/A	34% (*n*=17)	40% (*n*=20)	N/A	60% (*n*=30)
15. Is there a difference between advertisements and content?	92% (*n*=46)	N/A	8% (*n*=4)	18% (*n*=9)	N/A	82% (*n*=41)
16. Is health counseling provided by qualified professionals?	24% (*n*=12)	6% (*n*=3)	70% (*n*=35)	40% (*n*=20)	0% (*n*=0)	60% (*n*=30)
17. Does the website notify the need for medical consultation?	28% (*n*=14)	22% (*n*=11)	50% (*n*=25)	80% (*n*=40)	0% (*n*=0)	20% (*n*=10)
18. Does the website have interactive tools (forum, blog, chat, social media, comments)?	18% (*n*=9)	64% (*n*=32)	18% (*n*=9)	84% (*n*=42)	0% (*n*=0)	16% (*n*=8)
19. Does the website offer FAQ (Frequently Asked Questions) for users?	8% (*n*=4)	2% (*n*=1)	90% (*n*=45)	26% (*n*=13)	0% (*n*=0)	74% (*n*=37)
20. Does the website offer user help tutorials?	2% (*n*=1)	0% (*n*=0)	98% (*n*=49)	0% (*n*=0)	0% (*n*=0)	100% (*n*=50)
21. Does the website have "contact us"?	58% (*n*=29)	2% (*n*=1)	40% (*n*=20)	74% (*n*=37)	0% (*n*=0)	26% (*n*=13)

The quality of specific information on cancer treatment was performed by applying the QIC tool. Of the 32 initial sentences of the tool, 24 had suggestions for modifications, thus requiring two rounds of analysis with the specialists. Thus, in the end, the QIC tool was built with 26 sentences. Information about diagnostic exams for tumors, as well as the ages at which they should be performed, were present in 48% and 22% of websites for breast cancer and 42% and 78% for prostate cancer, respectively. As for the effects after performing tumor removal surgery, only 6% of breast cancer websites contained this information, contrasting with 50% of websites referring to prostate cancer. Both websites referring to breast and prostate cancer presented, respectively, 8% and 14% of information on integrative and complementary practices (Table 3).

Table 3. Quality assessment of specific information on pharmacological treatment of breast and prostate cancer using the QIC tool.

QIC	TREATMENT					
	BREAST *n*=50			PROSTATE *n*=50		
QUESTIONS	Total presence (2)	Partial presence (1)	Absence (0)	Total presence (2)	Partial presence (1)	Absence (0)
1. Does it mention the pathophysiology of cancer?	28% (*n*=14)	14% (*n*=7)	58% (*n*=29)	48% (*n*=24)	0% (*n*=0)	52% (*n*=26)
2. Does it specifically describe the origin of the cancer?	28% (*n*=14)	18% (*n*=1)	54% (*n*=27)	88% (*n*=44)	0% (*n*=0)	12% (*n*=6)
3. Does it describe risk factors for the specifically analyzed cancer (age, family history, overweight)?	50% (*n*=25)	0% (*n*=0)	50% (*n*=25)	54% (*n*=27)	42% (*n*=21)	4% (*n*=2)
4. Does it report the genetic risk involved in the occurrence of cancer?	20% (*n*=10)	20% (*n*=10)	60% (*n*=30)	90% (*n*=45)	0% (*n*=0)	10% (*n*=5)
5. Does it mention which specific exam should be performed for early diagnosis of the investigated cancer?	48% (*n*=24)	8% (*n*=4)	44% (*n*=22)	42% (*n*=21)	54% (*n*=27)	4% (*n*=2)
6. Does it mention at what age should a specific exam be performed to prevent the evaluated cancer?	22% (*n*=11)	6% (*n*=3)	72% (*n*=36)	78% (*n*=39)	0% (*n*=0)	22% (*n*=11)
7. Does it describe specific first signs and symptoms for the analyzed cancer?	48% (*n*=24)	4% (*n*=2)	48% (*n*=24)	90% (*n*=45)	8% (*n*=4)	2% (*n*=1)
8. Does it mention the possible effects after surgery to remove the tumor?	6% (*n*=3)	6% (*n*=3)	88% (*n*=44)	50% (*n*=25)	0% (*n*=0)	50% (*n*=25)
9. Does it mention treatment with integrative and complementary practices in health (acupuncture, meditation, aromatherapy, among others)?	8% (*n*=4)	0% (*n*=0)	92% (*n*=46)	14% (*n*=7)	0% (*n*=0)	86% (*n*=43)
10. Does it describe the possible stages/staging for the analyzed cancer?	30% (*n*=15)	0% (*n*=0)	70% (*n*=35)	52% (*n*=26)	0% (*n*=0)	48% (*n*=24)
11. Does it mention what is metastasis?	32% (*n*=16)	12% (*n*=6)	56% (*n*=28)	46% (*n*=23)	0% (*n*=0)	54% (*n*=27)
12. Does it describe the pharmacological treatment options for cancer (adjuvant, neoadjuvant and palliative)?	16% (*n*=8)	8% (*n*=8)	76% (*n*=38)	6% (*n*=3)	22% (*n*=11)	72% (*n*=36)
13. Does it describe what hormone therapy is?	26% (*n*=13)	6% (*n*=3)	68% (*n*=34)	54% (*n*=27)	0% (*n*=0)	46% (*n*=23)
14. Does it describe when the use of hormone therapy is indicated?	36% (*n*=18)	12% (*n*=6)	32% (*n*=26)	58% (*n*=29)	0% (*n*=0)	24% (*n*=21)
15. Does it mention the possible adverse effects of hormone therapy for the indicated cancer?	10% (*n*=5)	4% (*n*=2)	86% (*n*=43)	24% (*n*=12)	0% (*n*=0)	76% (*n*=38)
16. Does it describe the possible adverse effects related to chemotherapy?	16% (*n*=8)	6% (*n*=3)	78% (*n*=39)	22% (*n*=11)	0% (*n*=0)	78% (*n*=39)
17. Does it describe the risks of abrupt discontinuation of chemotherapy drugs?	2% (*n*=1)	2% (*n*=1)	96% (*n*=48)	0% (*n*=0)	0% (*n*=0)	100% (*n*=50)
18. Does it describe the contraindications for the use of chemotherapy?	0% (*n*=0)	0% (*n*=0)	100% (*n*=50)	0% (*n*=0)	0% (*n*=0)	100% (*n*=50)
19. Does it describe care during chemotherapy (hydration, sun protection, nutritional guidance, etc.)?	10% (*n*=5)	0% (*n*=0)	90% (*n*=45)	8% (*n*=4)	0% (*n*=0)	92% (*n*=46)
20. Does it mention the use of herbal medicines for the analyzed cancer?	2% (*n*=1)	0% (*n*=0)	98% (*n*=49)	18% (*n*=9)	0% (*n*=0)	82% (*n*=41)
21. Does it mention the contraindicated herbal medicines for the analyzed cancer?	0% (*n*=0)	0% (*n*=0)	100% (*n*=50)	0% (*n*=0)	0% (*n*=0)	100% (*n*=50)
22. Does it mention the use of alcohol concomitantly with the treatment?	2% (*n*=1)	0% (*n*=0)	98% (*n*=49)	4% (*n*=2)	0% (*n*=0)	96% (*n*=48)
23. Does it mention the use of tobacco concomitantly with the treatment?	0% (*n*=0)	0% (*n*=0)	100% (*n*=50)	0% (*n*=0)	0% (*n*=0)	100% (*n*=13)
24. Does it mention requesting professional guidance for compliance with the treatment or modification during treatment?	24% (*n*=12)	24% (*n*=12)	52% (*n*=26)	32% (*n*=16)	0% (*n*=0)	68% (*n*=34)
25. Does it mention another type of cancer other than the one involved in the search?	4% (*n*=2)	2% (*n*=1)	94% (*n*=47)	36% (*n*=18)	0% (*n*=0)	64% (*n*=32)
26. Does it mention the disposal of chemotherapy drugs, if used at home?	0 % (*n*=0)	0% (*n*=0)	100% (*n*=50)	2% (*n*=1)	0% (*n*=0)	98% (*n*=49)

Treatment options and information about the description of hormone therapy were present in 16% and 26% of websites for breast cancer and 6% and 54% for prostate cancer, respectively. Regarding the adverse effects of hormone therapy, only 10% of websites about breast cancer and 24% of those about prostate cancer contained this information. It is worth mentioning that a similar proportion was observed for the presence of information on the adverse effects of chemotherapy (16% and 22% of breast and prostate websites, respectively). With regard to care during therapy, only 10% of websites about breast cancer and 8% of those about prostate cancer contained this information. With regard to the indication of consultation with a health professional, 24% of the breast cancer websites and 32% of the prostate cancer ones presented such data and regarding the disposal of chemotherapy, only 2% of the prostate cancer websites contained such information (Table 3).

It was observed that for websites related to breast cancer, both in terms of content and technique, the quality of information was predominantly poor. On the other hand, for the treatment dimension, the quality was very poor. Websites related to prostate cancer treatment had a similar evaluation profile (Table 4).

Table 4. Final quality of the websites selected from the dimensions analyzed by the QIG and QIC instruments.

QUESTIONS	PERCENTAGE RANGE	BREAST			PROSTATE		
		QIG		QIC	QIG		QIC
		Content dimension	Technical dimension	Treatment dimension	Content dimension	Technical dimension	Treatment dimension
		n=50	*n*=50	*n*=50	*n*=50	*n*=50	*n*=50
GOOD	75≤ Σ ≤100%	10% (*n*=5)	0% (*n*=0)	0% (*n*=0)	4% (*n*=2)	18% (*n*=9)	2% (*n*=1)
REGULAR	50≤ Σ ≤74%	32% (*n*=16)	10% (*n*=5)	2% (*n*=1)	20% (*n*=10)	18% (*n*=9)	14% (*n*=7)
POOR	25≤ Σ ≤49%	54% (*n*=27)	60% (*n*=30)	28% (*n*=14)	46% (*n*=23)	56% (*n*=28)	66% (*n*=33)
VERY POOR	0≤ Σ ≤24%	4% (*n*=2)	30% (*n*=15)	70% (*n*=35)	30% (*n*=15)	8% (*n*=4)	18% (*n*=9)

DISCUSSION

The present study aimed to evaluate the quality of information on breast and prostate cancer treatment on Brazilian websites. It was observed that most of the evaluated websites had information quality far below the desired level, thus not being reliable sources of information. It is noteworthy that the websites related to the treatment of prostate cancer had a slightly better quality than those referring to the treatment of breast cancer. It is worth noting that evaluations similar to this one were carried out in other countries such as the United Kingdom[18,19] and the United Arab Emirates[20] and the results were heterogeneous.

In the United Kingdom, Nghiem *et al.* (2016) demonstrated that English websites had good quality information on breast cancer[18]. In contrast, the work by Narif and Ghezzi (2018) analyzed the quality of information on treatment options for breast cancer present on English websites and revealed that only 40% of these contained reliable information19. For the same type of cancer, Alnaim *et al.* (2019), in the United Arab Emirates concluded that only 6.6% of the websites were of good quality[20].

The work by Chang *et al.* (2018) regarding the quality of information about prostate cancer on English-speaking websites revealed that only 10.5% were quality certified through the HONcode seal[21]. On the other hand, Janssen *et al.* (2019) in Germany evaluated the quality of information on radiotherapy for prostate cancer on English-language websites and revealed that the majority had good quality[22].

It is noteworthy that providing low-quality information about health can impact the lives of people who seek guidance and help from digital technologies. Ribeiro *et al.* (2021) demonstrated, in Brazil, that when assessing the quality of information about analgesic drugs on Brazilian websites, 100% mentioned treatment possibilities[23]. Comparing this to the present study, in which, for both breast and prostate cancer, more than half of the evaluated websites contained this information.

By providing information on treatment possibilities, having data on their benefits and performance becomes relevant. Gibson *et al.* (2019) when assessing the quality of information on anticoagulants and antiplatelet agents on UK websites, realized that they only provided partial information on the benefits of treatments[24]. This data is

in line with the present study, in which less than half of the websites had such content.

Among the possibilities of treatments that can provide benefits to users, antineoplastic agents stand out since some are available to be used orally. The present study revealed that no website on breast cancer and only one on prostate cancer provided data on the disposal of chemotherapy drugs. Constantino *et al.* (2020) pointed out in a systematic review that, in households, the disposal of medicines in the common garbage and in the sewage system still predominates[25]. The lack of guidance and information can impact the environment, with contamination of water and the environment. soil and reinforce the need to create public policies aimed at the disposal of drugs.

Appropriate guidance involves the use of safe and quality sources to provide more recent and up-to-date data on a given topic. Li *et al.* (2021) when assessing the quality of information about breast cancer on Chinese websites, showed that only half revealed the source used[26]. This fact corroborates the present study in which less than a third of the websites contained this information.

It is noteworthy that the lack of this information does not only occur on websites with information about breast cancer. Perra *et al.* (2021) showed that only 44% of the websites in English presented the sources used on weight loss drugs[27]; Kuter *et al.* (2021) demonstrated that most of the websites evaluated on restorative treatments in pediatrics did not contain such data[28], similar to the data obtained by Reynolds *et al.* (2018) on lupus erythematosus[29]. This fact reinforces that the presence of sources that support the content is directly linked to the assistance given to the user of the information, allowing him to consult the original sources and become more integrated about his health and treatment.

The foundation of the content and presentation of the information sources is relevant, as well as the way in which health communication is carried out. In this context, accessible language facilitates understanding about the disease and treatment, enabling increased adherence to drug therapy. In addition, it guarantees the autonomy of the individual in the face of the condition he presents. Therefore, the use of medical jargon or technical language, as seen in about two thirds of the websites related to prostate cancer, can impair the understanding of the disease, symptoms and treatment[30].

In short, good communication, guidance, limitations of each individual and knowledge of patients are important factors when passing on health data. With regard to information, not only pharmacological treatment stands out, but also integrative and complementary practices. The present study pointed out that less than one fifth of the websites referring to breast and prostate cancer had complete information on integrative practices. Integrative and complementary practices are non-invasive techniques that expand the diversity of treatment, seek to insert the individual in the environment in which he lives in his health condition and are inserted in the context of the Unified Health System (SUS)[31].

In cancer patients, taking advantage of these practices can result in improved well-being and quality of life. Lima *et al.* (2015) demonstrated that homeopathy, phytotherapy and medicinal plants increased the feeling of well-being and positive bonds between patients and health professionals[32]. Thus, the presence of information about this content becomes essential for the patient to ensure well-being and quality of life in the face of the various cancer treatments.

CONCLUSION

The websites evaluated in this study had low quality information on breast and prostate cancer treatment. Therefore, reinforcing greater health education based on improving the quality of information on disease treatment available in digital technologies is necessary in order to promote access to good quality information.

REFERENCES

1. Agência Internacional de Pesquisa em Câncer. Cancer Tomorrow. A tool that predicts the future cancer incidence and mortality burden worldwide from the current estimates in 2020 up until 2040. [Internet]. IARC; 2020. [acesso 2021 Nov 29]. Disponível em: https://gco.iarc.fr/tomorrow/en
2. Agência Internacional de Pesquisa em Câncer. Brazil fact sheets. [Internet]. IARC; 2020. [acesso 2021 Nov 29]. Disponível em: https://gco.iarc.fr/today/data/factsheets/populations/76-brazil-fact-sheets.pdf
3. Sun YS, Zhao Z, Yang ZN, *et al.* Risk Factors and Preventions of Breast Cancer. Int J Biol Sci. 2017 Nov 1;13(11):1387-1397. doi: https://doi.org/10.7150/ijbs.21635.
4. Wöckel A, Albert US, Janni W, *et al.* The Screening, Diagnosis, Treatment, and Follow-Up of Breast Cancer. Dtsch Arztebl Int. 2018 May 4;115(18):316-323. doi: https://doi.org/10.3238/arztebl.2018.0316.
5. Rawla P. Epidemiology of Prostate Cancer. World J Oncol. 2019 Apr;10(2):63-89. doi: https://doi.org/10.14740/wjon1191.
6. Merriel SWD, Funston G, Hamilton W. Prostate Cancer in Primary Care. Adv Ther. 2018 Sep;35(9):1285-1294. doi: https://doi.org/10.1007/s12325-018-0766-1.
7. Descotes JL. Diagnosis of prostate cancer. Asian J Urol. 2019 Apr;6(2):129-136. doi: https://doi.org/10.1016/j.ajur.2018.11.007.
8. Nounou MI, ElAmrawy F, Ahmed N,*et al.* Breast Cancer: Conventional Diagnosis and Treatment Modalities and Recent Patents and Technologies. Breast Cancer (Auckl). 2015 Sep 27;9(Suppl 2):17-34. doi: https://doi.org/10.4137/BCBCR.S29420.
9. Debela DT, Muzazu SG, Heraro KD, *et al.* New approaches and procedures for cancer treatment: Current perspectives. SAGE Open Med. 2021 Aug 12;9:20503121211034366. doi: https://doi.org/10.1177/20503121211034366.
10. Lancee M, Tikkinen KAO, de Reijke TM, *et al.* Guideline of guidelines: primary monotherapies for localised or locally advanced prostate cancer. BJU Int. 2018 Oct;122(4):535-548. doi: https://doi.org/10.1111/bju.14237.
11. Lu X, Zhang R, Wu W,*et al.* Relationship Between Internet Health Information and Patient Compliance Based on Trust: Empirical Study. J Med Internet Res. 2018 Aug 17;20(8):e253. doi: https://doi.org/10.2196/jmir.9364.
12. Zhou L, Zhang D, Yang C,*et al.* HARNESSING SOCIAL MEDIA FOR HEALTH INFORMATION MANAGEMENT. Electron Commer Res Appl. 2018 Jan-Feb;27:139-151. doi: https://doi.org/10.1016/j.elerap.2017.12.003.
13. Sun Y, Zhang Y, Gwizdka J,*et al.* Consumer Evaluation of the Quality of Online Health Information: Systematic Literature Review of Relevant Criteria and Indicators. J Med Internet Res. 2019 May 2;21(5):e12522. doi: https://doi.org/10.2196/12522.
14. Al-Ak'hali MS, Fageeh HN, Halboub E,*et al.* Quality and readability of web-based Arabic health information on periodontal disease. BMC Med Inform Decis Mak. 2021 Feb 4;21(1):41. doi: https://doi.org/10.1186/s12911-021-01413-0.
15. Mendonça APB, Neto AP. Criteria to evaluate quality of information on health sites: a proposal. – Rev Eletron de Comun Inf Inov Saúde. 2015 jan-mar; 9(1). doi: https://doi.org/10.29397/reciis.v9i1.930
16. Pereira Neto A, Souza Valls de, R, Daumas, RP *et al.* Avaliação participativa da qualidade da informação de saúde na internet: O caso de sites de dengue.. Cien Saude Colet. 2017. doi: 10.1590/1413-81232017226.04412016.
17. Charnock D, Shepperd S, Needham G,*et al.* DISCERN: an instrument for judging the quality of written consumer health information on treatment choices. J Epidemiol Community Health. 1999 Feb;53(2):105-11. doi: https://doi.org/10.1136/jech.53.2.105.
18. Nghiem AZ, Mahmoud Y, Som R. Evaluating the quality of internet information for breast cancer. Breast. 2016 Feb;25:34-7. doi: https://doi.org/10.1016/j.breast.2015.10.001.
19. Arif N, Ghezzi P. Quality of online information on breast cancer treatment options. Breast. 2018 Feb;37:6-12. doi: : https://doi.org/10.1016/j.breast.2017.10.004.
20. Alnaim L. Evaluation Breast Cancer Information on The Internet in Arabic. J Cancer Educ. 2019 Aug;34(4):810-818. doi: https://doi.org/10.1007/s13187-018-1378-9.
21. Chang DTS, Abouassaly R, Lawrentschuk N. Quality of Health Information on the Internet for Prostate Cancer. Adv Urol. 2018 Dec 4;2018:6705152. doi: https://doi.org/10.1155/2018/6705152.
22. Janssen S, Fahlbusch FB, Käsmann L, *et al.* Radiotherapy for prostate cancer: DISCERN quality assessment of patient-oriented websites in 2018. BMC Urol. 2019 May 28;19(1):42. doi: https://doi.org/10.1186/s12894-019-0474-4.
23. Ribeiro AAR, Melo GLM, Costa MS *et al.* Analgesic drugs: What quality of information is present on the Internet? Res,Soci and Devel.2021. 10, 8, e25810817157. doi: http://dx.doi.org/10.33448/rsd-v10i8.17157 .
24. Gibson J, Ellis R, Jones S. 'Dr Google' Will See You Now! A Review of Online Consumer Information about Anticoagulant and Antithrombotic Medication for Prevention of Recurrent Stroke. J Cons Health Int. 23. 1-12. doi: https://doi.org/10.1080/15398285.2019.1570800
25. Constantino VM, Fregonesi BM, Tonani KAA, *et al.* Storage and disposal of pharmaceuticals at home: a systematic review. Cien Saude Colet. 2020 Feb;25(2):585-594. doi: https://doi.org/10.1590/1413-81232020252.10882018.
26. Li Y, Zhou X, Zhou Y, *et al.* Evaluation of the quality and readability of online information about breast cancer in China. Patient Educ Couns. 2021 Apr;104(4):858-864. doi: https://doi.org/10.1016/j.pec.2020.09.012.
27. Perra A, Preti A, De Lorenzo V,*et al.* Quality of information of websites dedicated to obesity: a systematic search to promote high level of information for Internet users and professionals. Eat Weight Disord. 2021 Mar 4. doi: 10.1007/s40519-020-01089-x.
28. Kuter B, Atesci AA, Eden E. Quality and reliability of web-based information regarding restorative treatment in pediatric patients. Eur Oral Res. 2021;55(3):104-109. doi: https://doi.org/10.26650/eor.2021812053
29. Reynolds M, Hoi A, Buchanan RRC. Assessing the quality, reliability and readability of online health information regarding systemic lupus erythematosus. Lupus. 2018 Oct;27(12):1911-1917. doi: 10.1177/0961203318793213.
30. Tiwary A, Rimal A, Paudyal B,*et al.* Poor communication by health care professionals may lead to life-threatening complications: examples from two case reports. Wellcome Open Res. 2019 Jan 22;4:7. doi: https://doi.org/10.12688/wellcomeopenres.15042.1.
31. Takeshita IM, Sousa LCS, Wingester ELC, *et al.* The implementation of integrative and complementary practices in SUS: an integrative review. B J Health Rer. 4;(2)7848-7861. doi: https://doi.org/10.34119/bjhrv4n2-319.
32. Felipette JL, Ceolin S, K Bruna *et al.* Uso de terapias integrativas e complementares por pacientes em quimioterapia. Avances en Enfermería. 2015; 33(3), 372-380. https://doi.org/10.15446/av.enferm.v33n3.53363