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SPECIALIZED INFORMATION ABOUT CANCER IN THE WEB EDITIONS OF MAINSTREAM PRESS IN SPAIN: *EL PAÍS* (ELPAÍS.COM) AND *EL MUNDO* (ELMUNDO.ES)

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Abstract

Cancer is a disease that in 2022 had an estimated incidence in Spain of 282,421 cases (IARC). Based on other similar studies, this study analyses the publications on the four types of cancer with the highest incidence (breast cancer, lung cancer, prostate cancer, and colorectal cancer) in the digital versions of the leading Spanish newspapers *El País* (elpais.com) and *El Mundo* (elmundo.es) during the period from 1 January to 31 December 2022. The aim is to determine the treatment and level of specialization in the generalist press, considering the following variables: byline, journalistic genre, subject matter, reference to relevant figures, section, sources, and linguistic resources. From these variables, based on a previous exploration, a series of categories were established for each

one of them. The data search was performed using the *My News* tool; the content analysis was done manually. The results show that the texts signed by specialized journalists represent a very small percentage; the most used journalistic genre is the article, and almost half of the texts analyzed appear in the Science or Health sections, the rest being spread over several sections. The theoretical review and the content analysis coincide in the need for specialized press coverage of a topic as relevant to public health as cancer.

Keywords: health, media, media agencies, science journalism, science, scientific communication.

1. Introduction

Cancer is a disease that affected more than 18 million people in the world in 2020 (SEOM, 2023). In Spain, that same year, according to information presented by the International Agency for Research on Cancer (IARC), the incidence was 282,421 cases, of which breast, prostate, colorectal and lung cancer were the most frequent (IARC, 2020).

In a problem of such social transcendence due to the number of people it affects, the role of media communication becomes a key factor. Journalism has the responsibility to provide accurate information to understand the situation of the disease in its social context. The nature of cancer-related information requires journalistic specialization in the field of science journalism. There is no consensus among the scientific community on who should write this type of information, some authors believe that such information can be done by a scientist who masters journalism skills or by a journalist who knows "basic and biomedical sciences to appropriate the language and knowledge to achieve its adequate articulation" (Gutiérrez & Rodríguez-Leuro, 2015). There is also a certain reluctance to speak of specialized journalists to distinguish between specialized and non-specialized journalism, for fear of denigrating journalists who are not specialized, since it is assumed that the practice of journalism itself entails that degree of responsibility and rigor that the treatment of information requires. The lack of specialization of journalists has been a matter of concern since the end of the last century, with some authors pointing out that newspapers can be an important source of medical information, but they can be inaccurate. Journalists may not have specialized knowledge of medicine or science, and their opinion of the information may differ from that of a scientist's perspective (Nelkin, 1996).

Journalists are not required to have a background in medicine or science; specialization in health provides them with the appropriate knowledge to turn to experts to provide them with the data to warn the population instead of generating alarm (Borzekowski *et al.*, 2014) or releasing inaccurate information.

As the 21st century progresses, the population increasingly demands greater access to health information (FECYT, 2022) and journalism is -or can be- the key tool to disseminate scientific advances. These two factors make the media face a great responsibility because the quality of the information published will depend on them (Sánchez-Ballestero, 2018). Journalistic specialization is even more desirable in times of information overload because of the need to mediate and verify information (Barrera-Páez, 2016; Catalán-Matamoros &

Peñafiel-Saiz, 2019). A desirable scenario would be to have professionals who develop "hybrid habits" that include the recipes of journalists and the biomedical science knowledge of scientists (Gutiérrez & Rodríguez-Luero, 2015).

1.1. Cancer in the media

The media play a very relevant role in the dissemination of research advances in such relevant topics as cancer: "(...) Science coverage in the mass media was and still remains the major channel that bridges the gap between science and the general public" (Schäfer, 2012).

Studies on the treatment of health in the press are gaining ground. It is notable the interest in knowing a general perspective of the treatment of the topic in the press, either in broad studies that include several newspapers (Días-de-Moraes, 2013) or in more narrow studies that focus on a couple of them (Quintana-Sáinz, 2018), or on specific diseases, as is the case of the study conducted by Sánchez-Ballestero (2018) on the presence of skin cancer in the media, focused on the online version.

Oncology began its journey through media publications in 1881. According to the 2011 Quiral Report, "*La Vanguardia* was the first media outlet to include an oncology publication in its newspaper", (...) "it was already a topic of interest at that time". This statement is based on a news item found in *La Vanguardia* on August 31, 1881 that talked about methods to cure cancer. As the 20th century progressed, not only cancer but health issues in general gained ground in the media as they became one of the major concerns of modern societies, as a basis for achieving the highest quality of life (González-Borjas, 2004). *La Vanguardia* was also the first newspaper to have a science page in 1962, which in 1982 would become a supplement (Barrera-Páez, 2016).

In terms of access to information, both in science journalism and in other journalistic specialties, the internet has surpassed the press, radio and television as the main media and has become the means by which society is informed about different events. According to the FECYT (2018) IX EPSCYT report "(...) in spite (of) the fact that the main medium for gathering information on science and technology is television, the internet surpasses this medium among people aged 15 to 34 years". Faced with this trend, the main reference newspapers adapted and created web editions of their publications. In 1994, *El Periódico de Catalunya* and *El Mundo* launched their digital editions. In 1996, coinciding with its twentieth anniversary, *El País* (Abadal & Guallar, 2010) joined this trend of the last decade

of the 20th century. Above all, in the first decade of this century, progress was made towards the consolidation of the digital press, with the birth of the Internet version of leading newspapers and the emergence of a large number of digital native media (Serrano, 2014).

Science journalism is no exception; science communication has been increasingly integrated into online media, taking advantage of information technologies to reach the general public (Sánchez-Holgado *et al.*, 2021).

As will be justified later in the methodology section, the online versions of *El País* and *El Mundo*[1] , the two most consulted reference newspapers in Spain, according to the General Media Study (EGM) (2022), were chosen for this study. In both cases, the digital headers work in a complementary manner to the print edition, without having replaced it.

Online versions offer advantages such as the use of multimedia tools; however, there is concern about the loss of journalistic quality in the treatment of scientific information due to the demands of immediacy and information abundance (González-Clavero, 2016). Journalism is developed under conditioning factors such as time, space and the editorial policy of the medium (González-Borjas, 2004). Health information requires great precision; inaccurate information on the Internet or an inadequate interpretation can be very detrimental to health and to the doctor/patient relationship.

The Internet offers the possibility of the free flow of information, which can be an advantage, but it also facilitates the flow of unverified information, as the Quiral Report warned:

> the person seeking information does not have enough criteria to recognize the degree of evidence in what they find. This risk is particularly high when we consider that, with respect to cancer, these are often people who are more vulnerable because they are subjected to intense emotional situations of anguish, fear, pain, uncertainty, etc. (Revuelta *et al.*, 2011).

[1] To speed up the writing process, the titles of the newspapers are given, considering that the web versions are the ones to have been analyzed and thus when *El Mundo* is mentioned, it refers to *elmundo.es* and when *El País* is mentioned, it refers to *elpais.com*.

In specialized information, the lack of resources in newsrooms has led news agencies to assume the role of intermediaries between scientific dissemination entities such as scientific journals, research centers and institutes and other agents involved in the communication process, such as the general media. However, the Internet facilitates direct contact between agencies and recipients (González-Clavero, 2016).

The level of credibility and trust that the population has on the media is one of the issues that most concern journalism studies. In specialized journalism, the dependence on agencies for the generation of content, as well as the use of sources and the time of dedication by journalists are also issues of special relevance because they give an idea of the level of specialization of the media and the resources allocated for the coverage of certain topics. Some authors such as González-Clavero (2016) also study the use of technological resources by agencies and the resulting changes in journalistic work.

Health information implies a deep knowledge of the subject and requires a rigorous and scientifically specialized treatment, "the availability of journalists specialized in health in any social communication media guarantees the continuous presence of this information with along with the constant generation of interesting and current information" (González-Borjas, 2004). It is a matter of coverage not being circumstantial, but becoming a systematized and continuous coverage, with a more responsible treatment, in which the information is contrasted, with more feature articles and less opinions (Catalán-Matamoros & Peñafiel-Saiz, 2019).

When certain information moves from scientific journals to the general media, it must have a journalistic language, suitable for reading and understanding by the general public, hence the need for specialized health journalists in the media. In 2021, the Eurobarometer stated that "most journalists who deal with biomedical issues do not have sufficient background to do so" (Brea-Carrasco, 2006).

The aim of this study is to analyze the media treatment of cancer in the web editions of *El Mundo* and *El País,* the most widely read generalist newspapers in Spain. It also aims to demonstrate that the treatment of information on cancer in the general media is not specialized.

2. Method

As stated in the introduction, in Spain during the year 2022 the incidence of cancer was 282,421 cases (277.72[2]), of which breast cancer had the highest number of cases -77.5-, followed by prostate -70.6-, colorectal -35.8- and lung -29.0- (IARC, 2020). These four types of cancer have been chosen for this study, considering that the number of incidences determines the media attention provided, as stated by Stryker *et al.* (2007): "(...) the four types of cancer with the highest incidence received the most media attention".

The Quiral Report (2011) provides a statement that strengthens this premise, when it explains that breast cancer had the highest number of incidences and was the type of cancer that generated the most journalistic attention in 2011, as had been the case in previous years.

2.1 Corpus of research

The web editions of *El Mundo* and *El País* were chosen because they are the most widely read generalist newspapers in Spain and because we found that other authors have selected these two media with the same argument (Quintana-Sáinz, 2018). The study was limited to certain types of cancer and did not address the treatment of the disease in general; the four types of cancer with the highest incidence in Spain in 2022, according to IARC, were chosen: breast, prostate, colorectal and lung cancer. The analysis period was between January 1 and December 31, 2022. This date was chosen because it was the year immediately prior to the study.

Independent searches were made in the two newspapers through the MyNews tool, a professional agency for monitoring national and international media. The use of this tool to collect the information was considered because it offers the possibility of establishing advanced search criteria and because it is a common tool in research of this nature (Quintana-Sáinz, 2018).

The criteria for the search were as follows:

[2] The estimate is made in number of cases per 100,000 inhabitants.

- Open section. The search was not limited to specific sections, since a previous exploration showed that these media have several sections where publications specific to the study can be collected. Previous studies showed that cancer information in the two selected media can be located in different sections. Quintana-Sáinz (2018) states that in *El Mundo* 95 % of articles providing information on cancer appear in five sections, of which Health, with 67 %, Science and Science/health with 6 % each, stand out. In *El País,* 95 % of the information was found in nine sections, with five main sections, of which Science occupies 35 %.
- The keywords "breast cancer" / "lung cancer" / "prostate cancer" / "colon cancer" / "colorectal cancer" were used.

After manually purging the texts that did not address the topic and those that were repeated because they mentioned several types of cancer, the research corpus was found to be made up of 71 pieces, of which 44 are from *El Mundo* and 27 from *El País*. Those texts that contained the word cancer were discarded, but did not deal directly with the subject, but did so indirectly, saying for example "this can cause cancer". We followed the same elimination criteria as other similar studies (Jenkins *et al*., 2020; Amberg & Saunders, 2020).

Table 1 shows a breakdown of the pieces found in the two media, according to the type of cancer, confirming the data pointed out by other authors (Williamson *et al*., 2011), the coincidence of the type of cancer with the highest incidence, breast cancer in this case, with the one that has had the greatest media repercussion.

Table 1. Coverage of cancer in the general press in Spain during the year 2022.

Type of Cancer	***Elmundo.es***	***Elpais.com***	***TOTAL***	***%***
Breast cancer	15	13	28	39,44 %
Lung cancer	11	5	16	22,53 %
Prostate cancer	9	3	12	16,90 %
Colorectal cancer	9	6	15	21,12 %
Total	44	27	71	100 %

Source: Own elaboration (2023).

2.2 Content analysis

For the establishment of the variables and categories of analysis, previous studies were taken as a starting point (Sánchez-Sabate *et al.,* 2021), adapted to the characteristics of this study. Variables such as the scientific specialization of the journalists (Moreno-Castro & Gil-Pérez, 2014), the subject matter, in which the importance of early detection and prevention was

considered (Marzo-Castillejo *et al.,* 2022) and advances in research or the analysis of the use of linguistic resources such as metaphors (Serra-Piana, 2020).

Coding was done manually, by one person, and was tested to resolve discrepancies with another person, both authors of the study. The content analysis was systematized through tables in which the following variables have been coded:

1. Journalistic genre. The aim is to know the type of journalistic genre used, since news, as an informative genre, generally denotes a more superficial coverage of the topic than interpretative genres such as reporting and chronicles. On the other hand, the article allows for an interpretation that goes beyond current information and considers more specialized elements (Moreno-Espinosa, 2007). The categories considered in this variable were: news, article, chronicle, reportage and interview.
2. The signature. The aim is to determine whether the publications are signed by specialized journalists, whether they are agency publications, media publications, signed by general journalists, or whether they are signed by others, such as companies or unidentified. In order to know the degree of specialization of the journalist, an Internet search of his or her trajectory or biography was used. In the case of specialized journalists, it was easier to find this degree of specialization because the media themselves include a brief biography along with the byline. The categories of analysis of this variable were: specialized journalist; journalist; agencies; newsroom and companies.
3. Thematic. The topics that give rise to journalistic coverage of the types of cancer considered for this study were analyzed. The categories in this analysis were: detection and prevention; research; deaths and others. It is worth mentioning that, in the first category, screening and prevention were taken into account. In the research category, texts dealing with diagnoses, treatments and news on scientific advances were grouped together. Finally, in the category of deaths, life histories were also considered.
4. Relevant character. In this category, we analyzed whether the journalistic text revolved around the relevance of the character, that is, whether the motive of the news item was the famous person rather than the cancer.
5. Section. Information was sought on the section in which each text was published because it was considered important to know whether the media have a specialized health section or publish it in another more general section. The boom in health information has led some general media to create a health section or a subsection within the Society macro-area (González-Borjas, 2004), even so, in most general media health information can be found in different sections. For this reason, this variable was established to determine the relevance given to it by the media. The categories analyzed were: health, science, other sections.

6. Sources. The sources resorted to in each of the journalistic pieces were analyzed, considering that the qualification and specialization of the sources gives reliability to the information (Sánchez-Ballestero, 2018). The categories analyzed were: researchers, physicians/oncologists, organizations, patients, does not resort to sources, other sources. This last category included texts referring to companies and institutions.
7. Linguistic resources. The use of metaphors in the development of the texts found was analyzed. Scientific journalists usually "translate" scientific language into colloquial language in order to bring the subject closer to a non-specialized audience, and for this purpose they resort to the use of metaphors (Serra-Piana, 2020). In this last variable, it was considered whether a text uses metaphors or not.

Table 2. Variables and categories of analysis

Variables	**Categories**
Journalistic genre	News, article, chronicle, reportage, and interview.
Signature	Specialized journalist, non-specialized journalist, agencies, newsroom, and others.
Thematic	Early detection and prevention, investigation, deaths, and others.
Relevant people	Famous and not famous.
Section	Health, science and others.
Sources	Researchers, physicians/oncologists, organizations, patients, other sources and does not draw on sources.
Linguistic resources	Yes/No

Source: Own elaboration (2023).

Finally, once the content analysis was completed, both researchers ensured that the data match rate was 100%.

3. Results

This section presents the results obtained by applying the content analysis to the selected pieces. As mentioned before, a total of 71 pieces were analyzed, 44 pieces in *El Mundo* and 27 in *El País*. First, the data will be presented comparing the two analyzed media and then the results will be discussed globally, considering the total number of pieces analyzed.

3.1. Journalistic genre

Table 3 shows that the most frequently used journalistic genre was the article, with a total of 35 of the 71 pieces analyzed, 19 in *El Mundo* and 16 in *El País*. The freedom of this journalistic genre for the treatment of complex issues, together with the versatility it offers to address a topic such as health, is a key factor for it to be the most recurrent genre in both media. It is followed by the news with 25 in total, 18 of them in *El Mundo* and 7 in *El País*. The chronicle, the reportage and the interview are reduced to a much smaller number in both publications.

Table 3. Journalistic genres used for the media treatment of cancer.

Genre	***El País***	***El Mundo***	**TOTAL**	**%**
News	7	18	25	35,21 %
Article	16	19	35	49,3 %
Chronicle	1	4	5	7,04 %
Reportage	1	2	3	4,22 %
Interview	2	1	3	4,22 %
	27	44	71	100 %

Source: Own elaboration (2023).

3.2. Authorship

Table 4 shows that most of the texts analyzed were signed by journalists covering all types of information and only 8 of the total (11.2%) were signed by specialized journalists, 5 of them in *El Mundo*, where we found Miguel Ramudo and Cristina Ruiz; and 3 in *El País*, where we found Vitoria d'Alessio and Manuel Ansede. As stated in the methodology, in order to know the specialization of the journalists, biographies were searched, in some cases, the media itself offers a small biographical sketch, as in the case of Cristina Ruiz, who appears in *El Mundo*[3] as "journalist specialized in health and health information", and Manuel Ansede in *El País* (he is a scientific journalist and was previously an animal doctor) or the

[3] https://www.elmundo.es/autor/cristina-ruiz.html

case of Miguel Ramudo[4] who has a blog in which he says "I am trying to make a name for myself in scientific and medical journalism".

As for the texts bearing the signature of the editorial staff, there are 8 in total (11.26%), 6 of them in *El Mundo* and 2 in *El País*. As for the texts signed by agencies, 13 texts were found in *El Mundo*, which may be the determining factor for the higher number of texts compared to *El País*, which does not publish any texts signed by agencies. In the category "companies" there are texts that are clearly sponsored, "Cancer is a pandemic that must be eradicated by promoting more investment in research" which appears in *El Mundo* on 19/10/2022 signed by UE Studio and which has the pretitle "OFFERED BY BANCO SABADELL", including in the subtitle "Sabadell Seguros, on the occasion of World Breast Cancer Day, donates 10,000 euros for research into new personalized therapies for this type of tumor".

Table 4. Authorship

Authorship	***El País***	***El Mundo***	**TOTAL**	**%**
Specialized Journalist	3	5	8	11,26%
Non-specialized journalist	21	14	35	49,3%
Agency	0	13	13	18,3%
Editorial staff	2	6	8	11,27%
Companies	1	6	7	9,86%
	27	44	71	100%

Source: Own elaboration (2023).

[4] https://miguelramudo.wordpress.com/
https://elpais.com/autor/manuel-ansede-vazquez/

3.3. Main subject matter

In terms of subject matter, as Table 5 shows, early detection and prevention were underrepresented, with 4 publications in *El Mundo* and 6 in *El País*. Most of the texts analyzed (52.11%) refer to research, generally referring to advances in scientific research, of which 13 are from *El País* and 24 from *El Mundo*. As examples of cancer prevention and detection, on 31/03/2022 *El Mundo* published "*The test that can reduce up to 30% the mortality rate in colon cancer | Health* " and *El País* on 14/09/2022 "*Ryan Reynolds records his first colonoscopy as part of a challenge and they discover a polyp: It saved my life*". In the latter case, the example of a relevant celebrity is taken to allude to the importance of prevention and early detection.

Table 5. Thematic

Thematic	***El País***	***El Mundo***	**TOTAL**	**%**
Detection and prevention	6	4	10	14,08 %
Research	13	24	37	52,11 %
Deaths	3	6	9	12,67 %
Others	5	10	15	21,12 %
	27	44	71	100 %

Source: Own elaboration (2023).

3.4. Relevant characters

With regard to texts in which a famous person is the protagonist of oncological information, 8 publications were registered in *El Mundo* and 4 in *El País*. As shown in Table 6, 12 articles refer to a famous person, which represents 16.9%. For example, on 10/02/2022 *El País* published "*Actress Isabel Torres, star of the series 'Veneno', dead at age 52*"; and in *El Mundo* on 20/05/2022 there was "Actress Marnie Schulenberg, star of 'As the world turns', dead at age 37 | Series".

Table 6. Relevant characters.

Relevant people	***El País***	***El Mundo***	**TOTAL**	**%**
Celebrities	4	8	12	16,9 %
Non-famous	23	36	59	83,1 %

27	44	71	100 %

Source: Own elaboration (2023).

3.5. Section

El País has differentiated Science and Health sections, as will be seen below; pieces on cancer can also be found in other sections such as Planet and Future, Society or the regional editions of the newspaper. The Health section of *El País* is called 'Health and Wellbeing', as shown in Table 7.

El Mundo has a Science and Health section, but differentiates into subsections of Science, on the one hand, and Health, on the other hand.

In this regard, 27 *El Mundo* articles were found in the health subsection without any publication in Science. *El País* had 4 publications in Science and 6 in Health and Wellbeing. Finally, in both media, a total of 17 publications each were grouped in sections other than those studied. This represents almost 50% of the publications in other sections, such as Society, Culture, Sports and Opinion.

For example, in *El País* on 07/04/2022 we find "the rawness of breast cancer" in the Society section, on 11/18/2022 the same newspaper publishes "Is lung cancer screening necessary? Controversy settles in a tumor that leaves 23,000 deaths a year" in the Health and Welfare section and on 01/22/2022, "The first cancer map of Spain and Portugal shows enigmatic patterns on both sides of the border", in the Science section.

In the case of *El Mundo*, on 11/31/2022 it publishes "How artificial intelligence can help prevent and cure breast cancer" and on 12/29/2022 it publishes "What is radon and why does it cause lung cancer?" in the Health subsection of the Science and Health section.

Table 7. Section

Section	***El País***	***El Mundo***	**TOTAL**	**%**
Health	6	27	33	46,47%
Science	4	0	4	5,63%
Other	17	17	34	47,88
	27	44	71	100%

Source: Own elaboration (2023).

3.6. Sources

In this variable, the sources used were analyzed, considering that the use of expert sources is a desirable aspect for the reliability of the information. Congruent with the subject matter, as shown in Table 8, the majority of the texts analyzed used expert sources, 23.94% used researchers and 25.35% used physicians/oncologists. A significant percentage also turn to organizations such as the World Health Organization (WHO) or the AECC (Spanish Association Against Cancer). On a few occasions, only 1 text in *El País* and 1 in *El Mundo,* patients were used as sources of information. In the "others" category, sources such as political leaders have been included when funding sources are mentioned and a historian when a cultural work is mentioned.

Table 8. Sources

Sources	***El País***	***El Mundo***	**TOTAL**	**%**
Researchers	7	10	17	23,94 %
Physicians/Oncologists	9	9	18	25,35 %
Organizations	2	9	11	15,49 %
Patients	1	1	2	2,81 %
Does not draw on sources	8	3	11	15,49 %
Others	0	12	12	16,9 %
	27	44	71	100 %

Source: Own elaboration (2023).

3.7. Linguistic resources

In this variable, the use of linguistic resources, such as metaphors, was analyzed, simply considering whether or not they were used. As shown in Table 9, 22 texts, representing 30.9%, use metaphors. For example, in *El Mundo,* dated 10/19/2022 under the headline "Breast cancer silenced: At first I hid it from my daughter. I did it out of pure love", the metaphor "like mortar rain" is used to refer to the strength and heavy consistency with which the news of cancer falls on the patient. Another example in *El País* dated 18/11/2022, under the title "Is lung cancer screening necessary? Controversy settles in a tumor that causes 23,000 deaths a year", the metaphors "it is difficult to be seen" assuming that tumor cells are not always in sight of the technological laboratory sections, and "open war" referring to the fight against tobacco as the main risk factor for lung cancer.

Table 9. Linguistic resources

Use of metaphors	***El País***	***El Mundo***	**TOTAL**	**%**
Yes	10	12	22	30,99 %
No	17	32	49	69,01 %
	27	44	71	100%

Source: Own elaboration (2023).

4. Discussion

We begin this section by pointing out, as a first statement, that the number of texts found was much lower than expected, we agree with Quintana-Sáinz (2018) when she states that the coverage of cancer is not so wide for the number of deaths it causes. Once it is assumed that coverage is low, the study shows that the type of cancer that obtained the highest number of results was breast cancer, which is also the one with the highest incidence (IARC, 2020). This data coincides with other studies on media coverage of cancer in the Spanish press (Quintana-Sáinz, 2018) and is consistent with the statement that higher incidence generates greater coverage (FECYT, 2022). The exception is skin cancer, which is not one of the types with the highest incidence, but generates greater coverage in the time of year of highest risk, which is summer (Sánchez-Ballestero, 2018).

Regarding the comparative analysis between the two media, *El Mundo* offers greater coverage, with 44 texts compared to the 27 found in *El País*. We also agree with Quintana-Sáinz (2018) on this point. However, when analyzing the authorship variable we find that *El*

Mundo has published 13 texts signed by agencies and *El País* none, this may mark the quantitative difference between one media and the other.

Continuing with the variable of authorship, in the overall analysis, we see that 11.26% of the texts have been signed by specialized journalists, compared to 49.3% signed by generalist journalists. This is a significant data because it speaks of the level of specialization of the media and on this point we do not find a notable difference between the two analyzed media, with 5 texts in *El Mundo* compared to 3 in *El País*. In this sense, there is a certain reluctance to distinguish between specialized and non-specialized journalism, for fear of denigrating journalists who are not specialized in a particular subject, "(...) the journalist who writes about health, as well as any other professional colleague, must strive to deliver quality, objective, impartial and truthful information to their readers" (Días-de-Moraes, 2008). However, many authors defend journalistic specialization due to the mastery of the subject and contacts with expert sources. Meneses-Fernández (2007) forcefully states "(...) the reluctance to distinguish between generalist and specialized journalism seems contradictory, as it does not detract from the quality or rigor of the former, since they are differentiated by theoreticians, by those in charge of news companies and by journalists". As far as specialized health journalists are concerned, Catalán-Matamoros and Peñafiel-Saiz consider:

> "(...)health journalists perform significantly differently than other authors in terms of journalistic genre, tone, sources, and length of the article. Health journalists wrote more features and less opinion articles, from a more neutral perspective, using a wider number of scientific sources, especially those from professional associations and scientific journals." (Catalán-Matamoros & Peñafiel-Saiz, 2019)

As we said, this study found that only 11.26% of the texts analyzed were signed by specialized journalists, confirming that the treatment of cancer in generalist publications in Spain lacks specialized treatment. The number of journalists involved in the publication of the texts is varied, and is not centralized in a specialized firm, coinciding with the study by González-Borjas (2004) which shows that despite "the advantages in the treatment of health information by a specialized journalist, most of the media do not have one" (González-Borjas, 2004).

Revuelta *et al.* (2011) argue that the role of the specialized journalist is indisputable in the information process, since he/she must play a critical role in the face of the more

propagandistic information of the research centers themselves. It also requires mastery of the subject (Meneses-Fernández, 2007) and the tone and structuring of the news under the support of expert sources (Catalán-Matamoros & Peñafiel-Sainz, 2019).

There is unanimity in the voices that defend journalistic specialization and the need for journalists specialized in health to have scientific knowledge, with few exceptions, such as the study by Cassany *et al.* (2018) who found that: "(...) science journalists do not consider training in science necessary to practice the profession, although at the same time they see mixed training and specialization as important (...)" (Cassany *et al.*, 2018). Finally, in this variable it was interesting to find 7 texts (9.8%) signed by companies. We agree in this point with Sánchez-Ballestero (2018) who found "the irruption of cosmetic companies in the development of information" to be "worrying".

Regarding the journalistic genres used by the media for the writing of oncologic information, the article is the most used genre in the publications of the two media studied with 35 texts representing 49.29%, followed by the news with 25 texts representing 35.21%. In *El País* we find 16 articles and 7 news items, compared to *El Mundo* with 19 articles and 18 news items. We turn once again to the difference that may be originated by the inclusion of agency texts, which are usually news. Other genres such as reportage and interview were less used. We agree with previous studies, such as Quintana-Sáinz (2018), where the article was the genre with the highest number of publications in *El País* and *El Mundo*.

In the variable of the subject matter, we find that the most addressed topics are detection and prevention, on the one hand, and research, coinciding in this last aspect with Quintana-Sáinz (2018). Cancer is a topic that, within the extensive field of health, generates great social interest and scientific advances show that prevention and early detection are fundamental for its treatment. Media coverage also has to do with the impact of prevention campaigns on the proliferation and development of cancer (Brown & Potosky, 1990). Likewise, detection and prevention are also issues related to advances in scientific research on the disease.

In the variable of celebrities as protagonists of the information, there is no consensus in the scientific community on the importance of "taking advantage" of the media influence of a celebrity to address a topic such as cancer. It is inevitable to address it, due to the imposition of the media agenda (Sánchez-Holgado, *et al.*, 2021; Revuelta & Minelli-de-Oliveira, 2008) and many times it is celebrities of social and cultural relevance who draw more attention to

the population, in the face of an advertising campaign (Cuenca-Octavio & Llorente-Barroso, 2023) or making a diagnosis or treatment public (Chapman *et al.*, 2005). In our study we found 12 texts (16.9%) with a relevant celebrities as the reason for the coverage, 8 in *El Mundo* and 4 in *El País*.

In relation to the sources of information, a specialized journalist has previous academic and training knowledge, as well as scientific contacts that allow the construction of information with greater elaboration ("longer texts and with greater graphic support" (Revuelta & Minelli-de-Oliveira, 2008). The structures under which the scientific journalist works, and the treatment of information are different among colleagues of different specialization. There is no notable difference between the two media analyzed in relation to the sources used. In the overall analysis we found 17 texts (23.94%) that use scientists as expert sources and 18 (25.35%) that use oncology physicians. This represents half of the texts analyzed. This data reflects the importance of expert sources in this type of journalism and confirms the need to maintain this collaboration between scientists and journalists in the social responsibility of educating and raising awareness among the audience on issues as important as health issues (Gutiérrez & Rodríguez-Leuro, 2015). Resorting to researchers and physicians as sources of information generates trust, due to the public perception that places them at a high level of credibility (FECYT, 2022). In the study on the coverage of breast cancer in *El País* by Días-de-Moraes (2008), 31% of the news items studied had a scientific journal as a source. The data found in this work suggest an evolution in journalism by resorting to expert sources, which implies an effort beyond resorting to scientific journals.

Patients as sources of information are not usually addressed in the press; in our study we found one text in each of the media analyzed. Días-de-Moraes (2008) found the presence of patients as sources of information in 26 of the 266 news items studied.

Linguistic resources such as metaphors or technical terms are often used in the treatment of cancer (Carrasco-García *et al.*, 2021). It is considered a very useful tool to bring scientific information closer to the general population. In our case 22 (30.98 %) of the texts analyzed resorted to metaphors in the treatment of information.

Finally, regarding sections, *El País* has separate sections, one for Science and one for Health, while *El Mundo* has two subsections, one for Science and one for Health, grouped under the section Science and Health. These data suggest an evolution, a few years ago the media did

not have a health section, the news occupied spaces mainly in the "Society" section (Días-de-Moraes, 2013). Even recognizing the progress, it was found that half of the publications are in the Science and Health sections and the other half is divided into other sections, as diverse as culture, society, sports, and opinion.

5. Conclusions

The media coverage of cancer in the general press in Spain does not correspond to the incidence of the disease or to its importance in terms of the number of deaths it causes. Although it is true that the cancer with the highest incidence (breast) is the one that generates the most journalistic coverage, the treatment in general is scarce. In *El Mundo* and *El País* the treatment is not specialized, most of the texts are not signed by journalists specialized in health, half of them appear in other sections and a high percentage are not derived from the consultation of expert sources. The positive aspect of this research is that a large part of the coverage is focused on advances in scientific research and an important part on detection and prevention. It should be noted that some of these works, as detailed in the results section, come from private companies that provide funding for the advancement of scientific research, as is the case of Banco Sabadell.

Journalistic specialization leads to a more adequate treatment of information in scientific terms, using expert sources, precise terminology and the rigor required by the subject matter. Consequently, the population has access to quality scientific information, under a journalistic treatment that provides them with a higher level of knowledge. This can have repercussions on better doctor-patient communication, since the correct treatment of cancer in journalism can help patients to lose their fear of the disease and to stop considering it a taboo or a "monster" about which little is reported. The scientific specialization of journalists promotes education and the generation of scientific knowledge in the population.

There is a real need for the mass media to bet on a media coverage of cancer, based on a specialized treatment of the information, produced by academically trained people, with a dedication that allows them to acquire experience and knowledge of the sources.

The work opens some lines of research, the need for a study that deals with the use of linguistic resources such as technicalities or metaphors in communicative structures is perceived, in order to check if they improve the understanding of the message according to the social vision that is used about cancer (Serra-Piana, 2020). In another sense, the concern

arises to know, for example, if the digital native press has represented any change, to analyze in depth the health sections of the general media and to explore the link between scientific communication and journalism as an indispensable way to contribute to the education of the population and the construction of a journalistic narrative about cancer.

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