

HOW DOES THE CHILEAN MINISTRY OF HEALTH COMMUNICATE ABOUT CANCER? ANALYSIS OF FACEBOOK AND INSTAGRAM POSTS FROM 2018 TO 2023

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Abstract

Introduction: This study inquired about the communication messages on social media sites Facebook and Instagram issued by the Ministry of Health of Chile about cancer during the period 2018-2023. **Objectives:** To explore the content of the messages based on the types of content and framing or media framing on cancer of the messages issued by the Ministry of Health of Chile. **Methodology:** From a universe of 14,644 publications, a sample of 354 results was analyzed. **Results:** In general, a low presence of the cancer disease was detected in the social networks studied. **Discussion:** For the most part, the

types of content of communication messages correspond to an initial and preventive phase of the disease; meanwhile, media frames were primarily positive. **Conclusions:** This study verified the lack of further development of specialized communication in the field of cancer in Chile.

Keywords: communication, health, scientific communication, social media, media framing, content analysis.

1. Introduction

Cancer is one of the leading causes of death, both in the world and in Chile. It is estimated that, worldwide, "one in six deaths is due to cancer, causing more deaths than HIV-AIDS, tuberculosis and malaria combined, which translates into 9.5 million deaths per year and an average of 26,000 people dying per day" (Ministry of Health of Chile, 2018, p. 23). It is projected that, by 2030, its advance will increase, reaching a "figure of 13.1 million deaths worldwide" (Ministry of Health of Chile, 2018, p. 23). This scenario does not exclude Chile, being this disease the second leading cause of death in the population, only surpassed by cardiovascular accidents (Ministry of Health of Chile, 2018). But, beyond the epidemiological figures, health experts assure that most of the risk factors and behaviors that predispose people to suffer from this disease are preventable. Among the main triggers are "unhealthy eating, physical inactivity, obesity, tobacco and alcohol consumption, occupational factors and environmental factors" (Ministry of Health of Chile, 2018, p. 54), being between "30 to 40% of cancers preventable" (Ministry of Health of Chile, 2018, p. 54). Therefore, many of its causes are controllable by people, who require to be warned of the risks of leading unhealthy lifestyles.

In this context, social media are media that play a preponderant role in people's health (Afful-Dadzie *et al.*, 2023; Stellefson *et al.*, 2020; Chou *et al.*, 2021). Specifically, Facebook and Instagram have been shown to be influential in issues related to people's health (Rivera *et al.*, 2022; Johnson *et al.*, 2022; Pinto *et al.*, 2021; Basch & Hillyer, 2020). For this reason, it is necessary to understand what happens with the communicational messages about cancer, especially those coming from national agencies that should dictate and ensure health standards related to the health of Chileans. For this reason, the Chilean Ministry of Health was chosen in order to understand what types of messages are communicated by this entity in light of the importance of the Chilean population considering that many of the risk factors or behaviors related to cancer are preventable.

1.1. Communicational messages on cancer

The recently created Center for Cancer Prevention and Control in Chile (CECAN by its initials in Spanish) has detected a diversity of cancer types according to the geographical areas of the country. In particular, it has established a category of seven varieties prevalent in the country: **(i)** lung, associated with mining and metallurgical activity in northern Chile; **(ii)** gastric, related to agriculture, *Helicobacter pylori* infection and poverty in central-southern Chile; **(iii)** gallbladder, associated with Mapuche ancestry; and, **(iv)** those

associated with large urban areas exposed to unhealthy environments (with unsafe neighborhoods, lack of active transportation and physical activity, high indoor and outdoor air pollution and easy access to and promotion of alcohol, ultra-processed foods and tobacco products) including breast, lung, cervical and colorectal cancer, among others (CECAN, 2022; Maturana *et al.*, 2023; Brito, *et al.*, 2020). Complementarily, the current Chilean National Cancer Plan 2018-2028 highlights the urgent need to prioritize this disease; although, among its strategic lines, in a very general way, its actions are indirectly linked to the communicational field. For example, in strategic line 1 on "promotion, education and primary prevention", objective 1.1. proposes the need to "educate the population regarding the importance of healthy lifestyle habits and raise awareness on the importance of cancer and how to prevent it", which is stipulated to be carried out through the "generation, systematization and dissemination of information of a communicational campaign regarding protective and risk factors, pointing out in the message the existing offer and the places of access to screenings" (p. 104-105). Therefore, in concrete terms, the national plan only considers the use of the concept "communicational campaign" linked to the communicational sphere; while linking this type of communicational efforts to the concrete stage of the cancer disease in its screening.

Considering that cancer is a disease composed of different stages, communication must play a key role in each one of them. Broadly speaking, it is known that there are seven major strategic lines of the Chilean oncology network linked to the development of this disease: **(1)** Promotion and prevention, **(2)** Screening, **(3)** Diagnosis, **(4)** Treatments, **(5)** Rehabilitation, **(6)** Pain relief and palliative care, and **(7)** Follow-up (Ministry of Health of Chile, 2018). Thus, we highlight that, based on the above, at the national level, only the screening stage is prioritized.

In this sense, it is not the same to design and implement messages in a health campaign about this disease for those who do not yet suffer from this disease, as opposed to a communication effort aimed at patients who are currently undergoing cancer treatment. For this reason, it is important to consider that communication messages should be situated, or rather, framed according to the situational context of each person and this disease.

In the field of communication and health, cancer constitutes a specific topic that has been addressed by the field of communications (Jerome & Ting, 2022; Conley *et al.*, 2021; Niu *et al.*, 2021). Although it is one of the oldest maladies of mankind, different communicational strategies have been examined to find the best way to communicate about it to people

(Pedersen *et al.*, 2020; Koenig-Kellas, 2021). Conceptualized as the uncontrollable reproduction of malignant cells in people, mass media, including social media, have the challenge of providing a new dimension in health care, allowing society to communicate about health problems that will impact and improve people's quality of life (Moorhead *et al.*, 2013).

1.2. Framing or Framing Theory

From the field of communications, several authors have studied the theory of framing or "media framing" (Entman, 1993; Guenther *et al.*, 2021). The latter has been conceptualized as the process of "selecting some aspects of perceived reality and making them more salient in a communicative text, in such a way as to promote a particular problem definition, an informal interpretation, a moral evaluation and/or a treatment recommendation for the element described" (Entman, 1993, p. 52). Its richness lies in four possible points of view from which it can be studied: **(a)** from the communicator, who indicates what is said; **(b)** from the text, constituted by what is said; **(c)** from the receiver, who receives the message or what is communicated; and **(d)** from the culture, considered as the environment in which the communicated message is inserted (Guenther *et al.*, 2021). Although a vast number of authors have studied framing in general (D'Angelo *et al.*, 2019; Entman, 1993; Scheufele & Tewsbury, 2007), the literature has also made it one of the theories commonly used in communication and health (Guenther *et al.*, 2015; Rothman & Salovey, 1997).

Framing is a concept that contributes to the possible representations people make about particular health issues. As Starr and Oxlad (2021) explain, it "influences readers' perspectives on the causes of and solutions to health problems, and how they make judgments about who or what is responsible" (p. 689). Media framing theory has been examined using different approaches (Guenther *et al.*, 2021). The first corresponds to frames differentiated into: (a) generic frames, corresponding to those that are episodic and thematic (Guenther *et al.*, 2021), such as "attribution of responsibility", "conflict", "human interest", "economic consequences" and "morality" (e.g., Semetko & Valkenburg, 2000); and, (b) thematic frames, applied to a specific topic (e.g., Entman, 1993). Usually, the communication discipline uses, for the most part, the latter type of frames (Guenther *et al.*, 2021).

A second classification of media framing is from two broad traditions: sociological (Entman, 1991; Gamson & Modigliani, 1989; Goffman, 1974); and psychological (Domke *et al.*, 1998;

Kahneman & Tversky, 1984). Specifically, the sociological tradition is that which has studied "frames in communication" (Chong & Druckman, 2007, p. 106), including how information is presented in the media considering the design of communicative and persuasive messages in health (Guenther *et al.*, 2021). Inserted in this type of frame, for example, Arthur Frank and Kari Solbraekke (2023), using ethnographies have examined how cancer survivors relate their experiences through "a form of writing" in the first person, where they deliver "a performative representation of survivorship as an ongoing process of dialogic exchange" (Frank & Solbraekke, 2023, p. 78). Thus, each patient emphasizes what he or she feels based on the thematic frame of cancer and his or her personal experiences as a survivor of this disease (Frank & Solbraekke, 2023).

A third area of study linked to this theory is the gain-frame and loss-frame approach. In particular, gain-frame points to "the benefits of taking action (i.e., a gain-framed appeal)"; while loss-frame is linked to "the costs of not taking action (i.e., a loss-framed appeal)" (Rothman *et al.*, 2006, p. S203). Both concepts are used to examine different media framings in communicational messages about "gain-framed statements [that] can refer to both good things that will happen and bad things that will not happen, while loss-framed statements can refer to bad things that will happen and good things that will not happen" (Rothman *et al.*, 2006, p. S203). Furthermore, according to the international literature,

When people are considering a behavior that they perceive involves some risk of an unpleasant outcome (e.g., it may detect a health problem), loss-framed appeals should be more persuasive. When people are considering a behavior that they perceive involves a relatively low risk of an unpleasant outcome (e.g., it prevents the onset of a health problem), gain-framed appeals should be more persuasive. (Rothman *et al.*, 2006, p. S205).

It has been shown that loss-frame messages are more persuasive and effective in promoting the detection of cancer diseases, such as asking people to undergo a mammogram or breast self-examination, among others (Rothman *et al.*, 2006). Meanwhile, in the case of behaviors that require prevention behaviors, in which people must be involved in a specific activity such as, for example, performing the behavior of applying sunscreen, messages of gain -gain-frames- are more persuasive (Rothman *et al.*, 2006). Regarding the possible neutrality of communicational messages in cancer, O'Keefe and Jensen (2009) established a state called "*kernel*", understood as:

basic root state mentioned in the message's description of the consequence. For example, in an appeal such as "If you have regular skin exams, you will reduce your risk of skin cancer," the kernel state is "skin cancer," which is plainly an undesirable state; that is, this appeal emphasizes the desirable consequences of compliance by discussing an undesirable kernel state ("skin cancer") that will be avoided. (O'Keefe & Jensen, 2009, p. 298).

Thus, in the case of those messages that cannot be classified as either positive or negative, there is the option that they only deliver their "*kernel*" accompanied by general information (O'Keefe & Jensen, 2009). So far, this *frame* approach has not been studied in Chilean media messages about cancer.

1.3. Social media, content and cancer

Current audience studies in Chile confirm that both Facebook (with 71 %) and Instagram (with 60 %) are the most used social media for information on any topic in the country (CADEM, 2022 ; Fernández-Medina & Núñez-Mussa, 2023) . In this area, Carrasco-García *et al.* (2021) confirmed that social media constitute "a space to talk about cancer. Platforms such as Facebook have been explored in different countries (Argentina, Chile, Colombia, and Spain), showing greater activity in the dissemination of this disease during periods of preventive campaigns, but aiming at a generic treatment" (p. 718). Moreover, after investigating the representation of cancer incidence and mortality in the Chilean media, the authors detected that there is instability between the coverage of cancer and its epidemiological profile, making "risk factors such as sex and age invisible, which thwarts the development of preventive behaviors in the population" (Carrasco-García *et al.*, 2021, p. 722). The above confirms that there is no consistency between what happens in Chile with the incidence and types of cancer, and its representation in the media.

Another interesting case to consider is the study conducted by Fernández-Gómez and Díaz-Campo (2020). The researchers analyzed the communication about cancer, during three months, carried out on Facebook by associations in Argentina, Chile, Colombia and Spain, finding that, "most of the messages refer to cancer in a general way, without addressing a specific one; they inform followers and create awareness in them" (Fernández-Gómez & Díaz-Campo, 2020, p. 35). This approach allows us to have a baseline, which accounts for what happens with communication and cancer in this social media.

Among the main studies on social media, content and cancer, it is essential to consider Stage *et al.* (2021), who studied "ugly feelings in the media". Specifically, through an investigation in the affective domain, the authors delved into experiences of "envy, embarrassment, annoyance, irritation, and skepticism" that young cancer patients have experienced on social media because of their disease. Likewise, in an earlier work, Stage *et al.* (2020) already report that "social media become increasingly important to young people after a cancer diagnosis, and that these young people interact with social media as (what we will call) vital media" (p. 1). Thus, the affective and temporal experiences of media and the disease of cancer are vital for different population groups.

Regarding Instagram, Varela-Rodríguez and Vicente-Mariño (2022) examined through a visual quantitative analysis the mentions of cancer in the world. As a result they concluded that,

the volume of mentions of a given cancer site on Instagram does not correlate with its prevalence, incidence, or mortality rates (...). Meanwhile, it is shown that breast cancer behaves as an outlier in social media, with a high volume of posts that seem to be motivated by the success of awareness campaigns (Varela-Rodríguez & Vicente-Mariño, 2022, p.40)

In relation to the other types of cancer and their risk factors, the authors conclude by acknowledging that, "other cancer sites with high prevalence, incidence or mortality are practically absent from Instagram. Notable cases are lung, prostate, pancreatic and stomach, some of the sites with higher mortality and lower online visibility" (Varela-Rodríguez & Vicente-Mariño, 2022, p. 40). In the specific case of Chile, Instagram is primarily seen as a means of communication for information linked to health campaigns. An example of this is the experience reported by Lengua *et al.* (2019), who give an account of a strategy and communication plan for a campaign focused on breast cancer awareness by the Arturo López Pérez Foundation (FALP, by its initials in Spanish). As part of this initiative, the authors mention Instagram as one of the social media, as well as Facebook, used to spread "the message that October is the month of the fight against breast cancer" (Lengua *et al.*, 2019, p. 14). Therefore, it is observed that Instagram is used, mainly, from the scope of delivering advice in prevention and education campaigns about the disease.

In light of the importance of communicational messages related to cancer, this study intends to be a first approach to the content of messages about cancer issued through social media,

particularly Facebook and Instagram, by the Ministry of Health of Chile. The main questions guiding this research are two: what types of content about cancer do the messages issued by the Chilean Ministry of Health have? and what type of media framing do the communicational messages delivered by this national agency to the Chilean population use? It is important to point out that, in the context of this first study, secondary data are used to carry out an inductive exercise that will allow characterizing how are the communicational messages about cancer that the Ministry of Health of Chile has issued during the last five years.

2. Method

This study corresponded to a quantitative methodology, by obtaining secondary data directly from the social media of the Ministry of Health of Chile; specifically, its Facebook: <https://www.facebook.com/ministeriosaludchile> and Instagram: <https://www.instagram.com/ministeriosalud>.

The sample was temporally limited to the last five years, between May 1, 2018 and April 30, 2023. A very broad period was selected with the purpose of collecting most of the communicative strategies used and the most frequently presented types of cancer during the time studied by the main national health organization in Chile. The reason for selecting this period of time is due to the fact that it is considered from the date of creation of the Instagram account of the Chilean Ministry of Health, until the date on which this research was initiated. In addition, it has also been taken into account that a period of five years would be enough time to analyze the communication strategy used by this institution.

To extract the necessary data, the *CrowdTangle* tool (CrowdTangle Team, 2022) was used, which is an application created by Meta that allows tracking public information in Facebook groups and pages, as well as public Instagram accounts. With this tool, all the publications made on the indicated dates were selected and downloaded along with the metadata to be analyzed, such as the date and time of publication, interactions (such as likes, comments, shares, reproductions in case of video content, among others). Subsequently, all data were converted into a .csv file and analyzed using Microsoft Excel.

The data extraction process to confirm the sample yielded a total of 14,644 publications belonging to the Ministry of Health. Then, a content analysis was carried out to select, specifically, only those publications related to cancer disease. This procedure was performed

by a keyword search of the publications, selecting all those that included one or more of the following terms: "cancer" (with and without tilde), "tumor", "carcinoma", "granuloma", "epithelioma", "sarcoma", "neoplasm", "cephaloma", "oncology" or "oncologist". As a result, the sample of this study corresponded to a total of 354 publications for the Ministry of Health, in both social media.

2.1. Study variables

Type(s) of cancer. Considering the existence of different types, a list was elaborated based on the following categorization: (0) cancer in generic form, in which option only the term "cancer" is mentioned; either, in generic form, or by any of the following words: "oncology", "oncologist", "neoplasm", "cancer" (with and without tilde), "tumor", "carcinoma", "granuloma", "epithelioma", "sarcoma", "neoplasm", "cephaloma", "oncology" or "oncologist"; (1) lung cancer; (2) gastric cancer, which included *Helicobacter pylori* infection; (3) gallbladder cancer; (4) cervical cancer; (5) skin cancer; (6) colorectal cancer; (7) thyroid cancer; (8) prostate cancer; (9) leukemia; (10) pancreatic cancer; (11) breast cancer; and, (12) other types of cancer.

Strategic lines of the Oncology Network in Chile. According to the strategic lines used by the Chilean Ministry of Health (2018), each of the publications were classified based on the following lines:

1. Promotion and prevention, which included cross-cutting public policies (tobacco, alcohol, healthy eating, physical activity, environment), vaccination (HPV, HBV, HCV) and photoprotection;
2. Screening (PAP, mammography, early detection of colon cancer, endoscopy, *Helicobacter* and others);
3. Diagnosis, through pathological anatomy (PAP cytology, biopsy, immunohistochemistry, FISH, and other specific tests), imaging (CT, MRI, breast stereotaxy, scintigraphy, ultrasound, PET-CT, SPECT-CT, endoscopy, colonoscopy, bronchoscopy and cystoscopy) and molecular diagnostic laboratory (molecular biology, flow cytometry, cytogenetics and FISH);
4. Treatments, consisting of oncology committee, childhood cancer, general and complex oncology surgery, chemotherapy (solid tumors, chronic lymphoma-leukemias and acute leukemias), bone marrow and pediatric transplant, hormone therapy, radiotherapy, radiosurgery, iodine therapy, biological therapy, oncology pharmacy and psychosocial intervention);
5. Rehabilitation, consisting of management of lymphedema, prostheses, orthoses, pain management, management of dysmobility syndrome, and management of chronic fatigue syndrome;

6. Pain relief and palliative care, consisting of home-based patient care, multidisciplinary and family-supported care, oxygen therapy and delivery of medications (opioids); and
7. Follow-up, ensuring all actions throughout the care process and after discharge in accordance with current protocols.

Framing. Following Rothman *et al.* (2006) and O'Keefe and Jensen (2009), this variable was classified as follows:

8. Gain frame, for those communication messages that address a positive area. For example, delivering cancer prevention benefits;
9. Loss frame, for those negative communicational messages related to the disease, such as, for example, its costs; and
10. Kernel, for those messages that cannot be classified as either positive or negative, providing only general information. Therefore, the term "neutral" was used in these cases.

2.2. Type of content

In the specific case of this study, we chose to work with a classification of thematic frames obtained from the researchers Pedersen *et al.* (2020), previously validated for analyzing the messages of a social media campaign on human papillomavirus vaccination. The classification used considered different thematic domains applied to social media that are extrapolable to cancer, consisting of: personal stories, stories of health professionals, publications of facts or data of interest, participation of other users, and news or events (Pedersen *et al.*, 2020). Then, based on this typology proposed by Pedersen *et al.* (2020), each publication was classified as:

11. Personal Stories, which included content related to sharing stories from the daily lives of people with cancer;
12. Stories of health professionals, considering personal accounts of health professionals to frame facts of daily experience;
13. Publications of facts or data of interest, which included publications that present concrete data, specific facts or information of interest about cancer, its symptoms, problems, importance or repercussions in today's society;
14. Participation of other users, corresponding to communicating facts through third-party interaction and dialogue used to raise cancer awareness;
15. News or events, the content of which consisted of publications with news and/or current events, directly related to cancer; and,
16. Not determined, when the content could not be included in any of the above categories.

2.3. Procedure and data analysis

Once the sample for this study was obtained, based on the literature reviewed, a coding template developed by the authors themselves was designed and applied, which included each of the study variables. Statistical analysis of the data was carried out using Microsoft

Excel spreadsheets, software used to generate tables, frequency distributions, means, and descriptive calculations. On the other hand, the classification of the content was performed manually, checking, firstly, the type of cancer the publication dealt with according to the variable type(s) of cancer and, secondly, following the proposal of Pedersen *et al.* (2020), the type of framing and content of the publications was categorized. This categorization allowed a balance to be maintained between the different types of framing and content published in social media.

The data analysis work was carried out independently by the authors of the research, each of them coding the data individually. Subsequently, the categories of analysis were pooled, and a comparison of the results was made between the authors, observing a total coincidence at the time of coding. For this reason, it was not necessary to establish any procedure to resolve coding conflicts.

To carry out a more objective analysis of engagement levels, the following formula was used: sum of the number of interactions (likes + comments + shared + saved) / number of followers at the time of publication x 100. In this way, it is possible to observe the reaction, taking into account the total number of people following each page at the exact moment when the publication was made.

3. Results

From the results obtained, firstly, at the time of obtaining the sample of the total of 14,644 publications belonging to the Ministry of Health, only 354 publications were found for the Ministry of Health, in both social media, about cancer. Thus, the first result obtained was that only 0.02% of the publications made on the official Facebook and Instagram accounts of the Chilean Ministry of Health deal with this specific problem for the country's inhabitants.

In the case of the variable studied with emphasis on the different types of cancer, it was observed that, what is most published in the studied social media of the Ministry of Health of Chile are publications about cancer, in general -without specifying any type of cancer-, both on Facebook with 41.89 % (n=124) and on Instagram, with 32.76 % (n=19) of the publications. In addition, it was observed that there is a lack in types of communicational messages for some types of cancer such as gastric, pancreatic or leukemia. Meanwhile, in the case of Facebook, the second most discussed type of cancer was cervical cancer, representing

24.66 % (n=73), followed by breast cancer with 14.19 % (n=42). In contrast, on Instagram, the second most frequent type of cancer was breast cancer with 27.59 % (n=16).

Regarding the interaction of followers, as presented in Table 1, it was observed that posts about thyroid cancer received the highest engagement - in the sense of adhesion - on Facebook (n=0.96); while, on Instagram, skin cancer was the one with the most reactions from followers of the Ministry of Health (n=21.72).

Table 1. Frequencies by type of cancer on Facebook and Instagram.

Type of Cancer	Facebook			Instagram		
	No. of posts	% posts	Engagement	No. of posts	% posts	Engagement
Cancer in general	124	41,89	0,25	19	32,76	8,80
Lung cancer	29	9,80	0,15	4	6,90	8,37
Gastric cancer	0	0,00	-	0	0,00	-
Gallbladder cancer	1	0,34	0,31	0	0,00	-
Cervical Cancers	73	24,66	0,35	5	8,62	8,80
Skin cancer	1	0,34	0,13	1	1,72	21,72
Colorectal cancer	1	0,34	0,11	1	1,72	4,59
Thyroid cancer	3	1,01	0,96	2	3,45	2,40
Prostate cancer	1	0,34	0,17	1	1,72	2,42
Leukemia	0	0,00	-	0	0,00	-
Pancreatic cancer	0	0,00	-	0	0,00	-
Breast cancer	42	14,19	0,23	16	27,59	6,81
Other type of cancer	19	6,42	0,71	9	15,52	6,44
TOTAL	296	100,00	0,30	58	100,00	7,67

Source: Own elaboration.

In the case of the variable on the different stages of cancer, based on the typology of the strategic lines used by the Oncology Network in Chile, it was observed that promotion and prevention is the most used, with 70.95 % of the publications on Facebook (n=210) and 75.86 % on Instagram (n=44). In addition to this last result, it is important to highlight that, in neither of the two social media studied, these are the lines that are most interesting for followers, who react to a greater extent to publications that follow a strategic line related to the diagnosis of the disease, in the case of Facebook users (n=0.35), and to screening, in the case of Instagram users (n=8.52).

Complementarily, it was observed that other strategic lines or stages of the cancer disease, such as treatments, rehabilitation, follow-up or pain relief and palliative care are not used as part of the communicational messages that the Ministry of Health of the Chilean government issues in the two social media studied to communicate about cancer. Table 2 below presents the frequencies according to the different stages of cancer defined by the Oncology Network in Chile.

Table 2. Frequencies by different stages of cancer, based on the typology of strategic lines used by the Oncology Network in Chile.

Strategic lines	Facebook			Instagram		
	No. of posts	% posts	Engagement	No. of posts	% posts	Engagement
Promotion and Prevention	210	70,95	0,29	44	75,86	7,51
Screening	40	13,51	0,25	13	22,41	8,52
Diagnosis	44	14,86	0,35	1	1,72	3,88
Treatments	0	0,00	-	0	0,00	-
Rehabilitation	0	0,00	-	0	0,00	-
Pain relief and palliative care	0	0,00	-	0	0,00	-
Follow-up	0	0,00	-	0	0,00	-
TOTAL	296	100,00	0,30	58	100,00	7,67

Source: Own elaboration.

In the case of the framing variable, when analyzing the type of framing presented in the publications on cancer made by the Ministry of Health of the Government of Chile in the

social media studied, it was found that most of the publications have a gain frame approach, both on Facebook, with 83.45 % (n=247); and on Instagram, with 67.24 % (n=39). It is also observed that gain frame is not the framing that receives the most interaction from users of the Chilean Ministry of Health. On Facebook, it is the neutral framing that receives the most reactions (0.5); while, on Instagram, the loss frame is the most preponderant (8.93) although it is quite similar to the gain frame (8.3). Details of the frequencies obtained on the types of framing for the communicative messages delivered are presented in Table 3.

Table 3. Frequencies by framing type for communicational messages delivered on Facebook and Instagram about cancer.

Framing	Facebook			Instagram		
	No. of posts	% posts	Engagement	No. of posts	% posts	Engagement
Gain frame	247	83,45	0,29	39	67,24	8,30
Loss frame	30	10,14	0,21	6	10,34	8,93
Neutral	17	5,74	0,50	13	22,41	5,20
TOTAL	296	100,00	0,30	58	100,00	7,67

Source: Own elaboration

Regarding the type of content observed from the perspective of Pedersen *et al.* (2020), on Facebook and Instagram of the Ministry of Health of Chile, it was obtained that publications about facts or data of interest, together with news or events, are the two most used content typologies to address cancer in the two studied social media of the Ministry of Health. On Facebook, content about facts or data represent 57.43 % (n=170) and news or events 40.20 % (n=119); and, on Instagram, posts about news or events are more common with 62.07 % (n=36), followed by facts or data with 32.76 % (n=19). The frequencies of communicational messages about cancer according to their type of content in the social media studied are presented in Table 4.

Table 4. Frequencies of communicational messages about cancer by type of content on Facebook and Instagram of the Ministry of Health of Chile.

Type of content	Facebook			Instagram		
	No. of posts	% posts	Engagement	No. of posts	% posts	Engagement
Personal stories	1	0,34	0,14	1	1,72	1,25
Professional stories	0	0,00	-	0	0,00	-
Facts or data	170	57,43	0,26	19	32,76	7,94
Other users	4	1,35	0,20	1	1,72	10,65
News or events	119	40,20	0,35	36	62,07	7,77
Undetermined	0	0,00	-	1	1,72	2,58
TOTAL	296	100,00	0,30	58	100,00	7,67

Source: Own elaboration

4. Discussion

The present study shed light on several variables related to communicational messages on Facebook and Instagram linked to the Ministry of Health of Chile on cancer. In general, after analyzing the communicational messages about cancer received by the Chilean population, the first thing that caught our attention was the scarce presence of this disease in the social media studied. Despite the fact that it is one of the most prevalent diseases in Chile, only 0.02% of the publications made on the official Facebook and Instagram accounts of the Chilean Ministry of Health dealt with this problem.

According to the results obtained, the first conclusion to be drawn from this research is the little importance that cancer has in the social media communication of the Chilean Ministry of Health. While it is true that, within the period analyzed we find the pandemic caused by COVID-19 in 2020 and that, possibly, has been able to absorb an important part of the publications in social media of this organization, it is very significant that only 0.02% of the content published on Facebook and Instagram by the main health authority of the country is about cancer in the last 5 years.

A second aspect to consider was that the scenario described by Fernández-Gómez and Díaz-Campo (2020) was confirmed; finding that most types of cancer in the social media studied are addressed in a general way, which coincides with the results of this study. Complementarily, in relation to the types of cancer, our study coincides with the findings of Varela-Rodríguez and Vicente-Mariño (2022) and Lengua *et al.* (2019), where breast cancer is the one with the highest preponderance. However, it is important to note that cervical cancer also has a high preponderance on Facebook, but not on Instagram in the Chilean case.

A third relevant finding to highlight is that the cancer promotion and prevention stage was the most used in the social media studied by the Chilean Ministry of Health. Although this disease has multiple stages, the results obtained confirmed that the communicational messages issued by Facebook and Instagram are intended only for the initial phase of this disease. Moreover, considering that in its National Action Plan 2018-2028, the Ministry of Health highlights only the specific stage of screening; in the results of this study show that it is only the second stage that emerged the most, behind its promotion and prevention. In addition, considering that cancer is a disease that considers multiple stages, the absence of mentions for the stages of treatment, rehabilitation, pain relief and palliative care, and follow-up, not only leads to a greater lack of knowledge of each of the latter by the population, but also to patients and families of cancer patients feeling invisible in these social media.

Regarding the framing or media framing of the messages on cancer communication, it is necessary to highlight two aspects: **(a)** on the one hand, the communicational messages issued by the Ministry of Health of Chile are, preponderantly, from a gain frame. That is, a positive or benefit frame is used to allow the users of these social media to face the disease from that point of view; and, **(b)** on the other hand, from the point of view of those who receive the communicational messages about cancer, their greater engagement -adhesion- is given in the messages that are presented in a neutral form (kernel) on Facebook, and in the sense of loss frame on Instagram. Therefore, it is interesting to note that the communicational view that the national health organization delivers does not coincide with the interests or the view of the users of the social media studied, in relation to cancer. In addition, according to the international literature, the communicational messages about cancer that use a loss frame media frame in the prevention and diagnosis stage are more persuasive (Rothman *et al.*, 2006); than those of gain frame that were detected at the same

stage in this study. Therefore, we envision the need to continue advancing in the study of framing in Chile in relation to communicational messages about cancer.

A fifth and final finding was that the type of content most used on the Chilean Ministry of Health's social media, to address cancer, were facts or data of interest, and news or events. While these contents have some impact in today's society and can help increase the reliability and credibility of the information, it is the stories, both personal and professional, that generate the most interest and reliability as observed in previous literature (Pedersen *et al.*, 2020), for that reason it is recommended that public institutions such as the Ministry of Health make the most of more personal content and with professional approaches. In addition, presenting content narrated from the perspective of health experts would bring the message more directly closer to the target audience itself, which is why it is surprising that this is completely non-existent in the last 5 years.

From the above results, it is possible to link that the current communicational messages on cancer issued by the Chilean Ministry of Health, specifically in the social media studied, emphasize only the prevention and promotion of this disease in its early stages. In addition to this, there is also the appeal of the media framing of the "gain frame", and that the messages are based on facts or data of interest and not on personal stories. All this reinforces the need that, in terms of communication, the current messages on cancer require greater strategic planning regarding what needs to be said about this disease, covering and considering all cancer patients, and not only its early stages. In this sense, works by authors such as Frank, Stage and Solbraekke (Frank, 1994; Frank & Solbraekke, 2023; Stage *et al.*, 2020; Stage *et al.*, 2021) show the richness of narration, both in the first person and dialogic, as a specific methodology to address this disease, allowing cancer patients to feel visible.

In general, and considering the initial research questions of this study, it is possible to conclude that: **(a)** the types of content of the communicational messages issued on cancer by the Ministry of Health of Chile are only limited to an initial and preventive phase of this disease; and, **(b)** that the type of framing or media framing used in the communicational messages delivered by this national agency to the Chilean population are mostly positive although, in the future, it should be investigated whether these are sufficiently persuasive for the Chilean population. Although this study constituted a first approach to the publications on Facebook and Instagram social media in this country on cancer, it was found

that there is still a lack of presence of a greater development of specialized communication on the field of this disease in Chile.

Finally, it is considered that this study also opens new avenues of research in this area. On the one hand, it could be of interest to analyze the communication of other official organizations dealing with cancer in Chile in order to compare their communication strategies in social media. Also, the study of the temporality and variation over time of the volume of cancer posts as a function of their subject matter or other possible variables is considered. Thus, it is observed that the open line of research still has a long way to go and it is possible to maintain the focus of research in this area.

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Conflicts of interest

The authors indicate that there are no conflicts of interest.

Statement of authorship - CRediT

Javier Abuín-Penas: conceptualization, data curation, formal analysis, research, methodology, project management, software, supervision, validation, visualization, writing - original draft.

Claudia A. Montero-Liberona: conceptualization, data curation, formal analysis, fund acquisition, research, project management, resources, software, supervision, validation, writing - review and editing.

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