

In the era of disbeliefs and uncertainties: news coverage of vaccines in Portuguese newspapers

Na era das descrenças e incertezas: a cobertura jornalística sobre as vacinas nos jornais portugueses

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Abstract

At a time when anti-vaccine movements are spreading, European countries are experiencing a decrease in immunization rates. In this context, the media can play a key role both in spreading beliefs and in circulating reliable information on the subject. This study aimed to analyze the journalistic coverage of vaccines in the Portuguese press by assessing the content of 300 articles published from 2012 to 2017 in the newspapers *Diário de Notícias* and *Jornal de Notícias*. Most texts addressed themes related to vaccine stock, vaccine research, vaccination coverage, and vaccination campaign regarding influenza, measles, and meningitis. Possibly influenced by public health policies in Portugal, vaccines comprise the media agenda of newspapers. These findings reinforce the perception that the media can be used as a tool for disseminating reliable information on this subject. Most of the articles had a positive and neutral tone concerning immunization, but, although little present, headlines emphasizing adverse reactions could foment or increase distrust in the benefits of vaccines.

Keywords: Immunization; Media; Public Health.

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Resumo

Os países europeus estão experimentando uma redução nas taxas de imunização em um momento de expansão dos movimentos antivacinas. Nesse contexto, a mídia pode desempenhar um papel crucial, tanto na difusão de crenças, quanto na circulação de informações confiáveis sobre o tema. Este estudo analisou a cobertura jornalística sobre vacinas na imprensa portuguesa. Foi realizada uma análise de conteúdo em uma amostra de 300 artigos publicados no *Diário de Notícias* e no *Jornal de Notícias* de 2012 a 2017. Houve uma predominância de textos relacionados às vacinas contra a gripe, sarampo e meningite. Os temas mais frequentes foram: estoque de vacinas, pesquisa sobre vacinas, cobertura vacinal e campanha de vacinação. A maioria dos artigos apresentou um tom positivo e neutro em relação à imunização. Os jornais colocaram as vacinas em sua agenda midiática, possivelmente influenciados pelas políticas de saúde pública presentes em Portugal. Tais achados reforçam a percepção que a mídia pode ser um instrumento na divulgação de informação confiável sobre o tema. Apesar de o tom negativo ser pouco presente, títulos de notícias com ênfase nas reações adversas das vacinas poderiam contribuir para despertar ou aumentar a desconfiança nos seus benefícios.

Palavras-chave: Imunização; Mídia; Saúde Pública.

Introduction

One of the most efficient tools for the promotion of individual and public health, immunization contributed to the decline of several infectious diseases, drastically reducing infant mortality rates since the 20th century, which led to a great development in public health worldwide (Greenwood, 2019).

Despite this history, some countries currently experience disbelief towards vaccines, leading to a reduction in immunization rates. This situation increases the number of sick people and deaths related to vaccine-preventable diseases. A significant example is that of measles, with an increase in cases of around 30% globally in recent years (WHO, 2019).

One of the facts attributed to the decrease in these rates is the anti-vaccination lobby that has been gaining momentum in these countries. In this scenario, many governments, as well as the World Health Organization (WHO), are in an alert state due to the impact that anti-vaccination movements can have on the population's health. One of the measures taken by the WHO was ranking the hesitation towards vaccination against the ten main threats to public health worldwide (WHO, 2019). Hesitation regarding vaccination is a complex concept and depends on the cultural and historical context, which varies according to time, place, and vaccines themselves. This concept refers to the reluctance or refusal to be vaccinated, despite vaccination services being available to the population (MacDonald, 2015).

In this context, the media, one of the most important institutions in the constitution of social imaginaries (Oliveira, 2014), can play a crucial role in channeling health-related information and influence behaviors regarding the subject (Catalan-Matamoros, 2015).

In a systematic review of the studies that analyzed journalistic coverage of vaccines, Catalan-Matamoros and Peñafiel-Saiz (2019a) found that negative messages and poor quality of information related to vaccines predominated in most of the articles analyzed. The authors also identified that most investigations centered their

analysis on the American media, whereas, in Europe, the UK press predominated. In Portugal, a study analyzed the coverage of prevention in the Portuguese media with a focus on sources of information about vaccines (Gomes; Lopes, 2019). This gap in the field of communication and health points to the need for new studies covering other countries, contributing to expand knowledge about how the media in different nations and cultures presents and gives visibility to the subject.

This work aims at filling this gap by promoting an analysis of the Portuguese media. Portugal, which has had a National Vaccination Program (Programa Nacional de Vacinação, or PNV) since 1965, has seen the return of vaccine-preventable diseases, such as the increase in whooping cough cases in recent years (Santos, 2013), as well as measles outbreaks in 2017 (Pimentel, 2017). Ordinance No. 248/2017, which establishes the governance model of the PNV, exposes the need for an ongoing advertisement about the relevance and benefits of vaccination in a European context of hesitation concerning the practice (PORTUGAL, 2017).

This study aims at mapping the characteristics of coverage on vaccines in Portugal while identifying the most frequent subjects and approaches present in the Portuguese press.

Theoretical framework

This study was anchored in the scheduling theory (*agenda-setting*), which is mainly based on the conception that the media will not reflect reality, but rather filter and shape it, focusing on issues that may lead the public to perceive them as more important than others (McCombs; Shaw, 1972). The authors argue that readers not only learn about a particular subject but are also influenced based on the amount and importance given to that information by the media.

According to Oliveira (2014), by editing and making only some aspects of reality, the media build visions about reality, delimiting what should be seen, observed, or commented on, and creating a public agenda that will shape different social imaginaries.

Pacheco and Boushey (2014) analyzed the *agenda-setting* on vaccines within the field of public health, finding that interest groups, as well as governments can skillfully use the media to raise awareness about health-related issues. From this perspective, this theory can help us understand how the media shape public awareness regarding vaccines in a context where reliance on immunization is becoming a public health challenge.

Material and methods

Through a quanti-qualitative approach, documental research was carried out with content analysis, having the contributions of the agenda-setting theory as a theoretical reference. The choice for the investigated newspapers was based on their representativeness and availability criteria, which led us to select the generalist newspapers *Diário de Notícias* and *Jornal de Notícias*, both centenary daily publications in Portuguese, currently under the tutelage of the *Global Media Group*.

Founded in 1888, *Jornal de Notícias* is headquartered in the city of Porto, in the North of Portugal, being a national publication with a rather popular approach. As expressed on its website, the journal defines its editorial line as “close to the people and their causes, [...] characterized by solidity, trust, and close proximity to the readers”. The Lisbon-based *Diário de Notícias* is the oldest newspaper still in circulation within the country. Founded in 1864, it is regarded as a reference diary, with a close connection with Portuguese society. On its website, it expresses its main objective as “to assure the reader the right to be informed with truth, rigor, and exemption”.

The research comprised the period between January 1, 2012, and December 31, 2017. A search was carried out through Factiva, an international news database. Keywords were used in Portuguese [*vacin** OR *imuniza**], which were expected to be included in the titles and subtitles. All articles published during the period were included in the search (news, notes, reports, interviews, editorials,

and opinion pieces). Throughout this study, the term “text” or “article,” when used, refers to the described pieces. Duplicate articles and those using the term “vaccine” with a metaphorical meaning were excluded from the sample.

2012 was selected as the starting point of this analysis as it was the year in which Europe experienced significant outbreaks of vaccine-preventable diseases, as in the case of the United Kingdom, which faced declines in childhood vaccination rates due to the significant presence of anti-vaccination lobbying activities during that same year (Gander, 2017).

The articles were read and reread in their entirety in order to characterize the most frequent subjects and approaches within the analyzed pieces to compose the corpus of analysis. From a public health perspective, the tone of a news story can indicate whether a particular vaccine receives media support or will have its use criticized. The present study was based on a typology used by Tsuda et al. (2016), in which the text may have a positive, neutral, or negative tone. The tone is deemed positive when the article focuses on the benefits of vaccination; neutral, if there is no position either against or in favor of vaccination; and negative, if the text highlights the risks related to vaccines or discourages people from getting immunized.

The articles were also grouped into subjects, having the presence of similar characteristics as a criterion for their classification, thus representing the events that took place in the coverage of vaccination by the newspapers investigated. Although more than one subject could be present in a single article, each piece was classified according to the most predominant.

The variables concerning the types of vaccines present in the news coverage are described in Table 1.

To ensure reliability in data systematization, they were compiled by the first author (AL), followed by a second investigator (DCM). After this stage, changes were made to the coding scheme to resolve any disagreements identified and ensure 100% agreement.

Table 1 – Types of vaccines and disease-related specificities

Types of vaccines	Comprises the following illnesses or specificities
Influenza	Seasonal influenza; H1N1
Cancer	Cervical and stomach cancer
Hepatitis	Hepatitis A, B, C*
Meningitis	Meningitis B; meningitis C, pneumonia, ear infection, and septicemia.
Tetavalent	Diphtheria, tetanus, whooping cough, and polio
Pentavalent	Diphtheria, tetanus, whooping cough, <i>Haemophilus influenzae b</i> , and polio.

* No vaccine against hepatitis C has been developed as of yet.

Findings

Between January 2012 and December 31, 2017, a total of 337 articles were published, of which 37 were disregarded according to the following exclusion criteria: duplication, focus on animal vaccination, and metaphorical use of the term “vaccine”.

The final sample included 300 articles. Of those, 166 articles were published by *Jornal de Notícias*, while 134 texts were released by *Diário de Notícias*, with no significant differences between them ($\chi^2=3.413$; $p=0.065$; $df=1$). Though, there were significant differences ($\chi^2=15.160$; $p=.010$; $df=5$) regarding the volume of publications per year. 2013 ($n=64$) and 2017 ($n=62$) concentrated the largest number of articles concerning vaccination, while 2016 was the year with the least information coverage ($n=30$), as shown in Table 2.

News predominated ($n=208$) in the journalistic genre. Other genres were: notes ($n=61$), reports ($n=18$), opinions ($n=8$), and interviews ($n=5$). The texts that made the front page of newspapers represented 17% of the sample ($n=50$), with 14 of them being headlines.

Table 2 – Number of articles published in the investigated journals (per year)

Analyzed period	N	%
2012	47	15.7
2013	64	21.3
2014	50	16.7
2015	47	15.7
2016	30	10.0
2017	62	20.7
Total	300	100.0

The articles dealt with different types of vaccines, however, those related to influenza, measles, and meningitis predominated (Table 3). We could also highlight the significant presence of news about vaccines under research, such as those related to diseases like Ebola, AIDS, malaria, Alzheimer's, cancer, Zika, and leprosy.

There were significant differences regarding the tone of the article between the categories ($\chi^2=103.740$; $p<.001$; $df=2$). Most articles kept either a positive ($n=162$) or neutral ($n=117$) tone, as in the examples: "Effective vaccine against meningitis B" (Vaccine, 2012) and "Help for vaccines and consultations" (Ajuda, 2017). The "n" represents the individual number of each of these vaccines, which were grouped by having the same "n".

Table 3 – Types of vaccines identified in journalistic coverage in Portugal

Types of vaccines	N	%
Influenza	88	29.33
Measles	37	12.33
Meningitis	28	9.33
Tuberculosis	21	7.00
Tetravalent/pentavalent	15	5.00
Hepatitis	12	4.00
Meningitis/rotavirus	10	3.33

continue...

Table 3 – Continuation

Types of vaccines	N	%
Ebola; HPV	9	3.00
HIV/AIDS	6	2.00
Malaria	5	1.66
Polio	4	1.33
Alzheimer's; cancer; Zika*	3	1.00
Leprosy/cutaneous leishmaniasis	2	0.66
Intestinal bacteria; dengue; yellow fever; tetanus/diphtheria; intranasal vaccine; respiratory virus*	1	0.33
General/unidentified	39	13.00

The articles were grouped into 17 thematic categories. Articles related to vaccine supply, research on vaccines, vaccination coverage, and vaccination campaigns prevailed, for a total of over 50% (Table 4).

Table 4 – Subject categories in articles published by Jornal de Notícias and Diário de Notícias

Categories	Number	Frequency
Vaccine supply	54	18.00%
Research on vaccines	48	16.00%
Vaccination coverage	36	12.00%
Vaccination campaign	31	10.00%
Access to vaccines	25	8.00%
Anti-vaccination movements	18	6.00%
Outbreaks/Epidemics	17	5.67%
Changes to the vaccination program	16	5.33%
Prevention strategies	16	5.33%
Mandatory vaccination	8	2.67%

continue...

Table 4 – Continuation

Categories	Number	Frequency
Severe reactions	7	2.33%
Irregularities regarding vaccines	6	2.00%
Assaults on health professionals	3	1.00%
Low purchasing power preventing vaccines procurement	2	0.67%
Public spending on vaccination	2	0.67%
Scientists' obituary	2	0.67%
Others	9	3.00%
Total	300	100%

The first category focused on the lack of vaccines in health centers, hospitals, and pharmacies (n=54), as in the works: “Norte has been out of vaccines for three weeks” (Norte, 2012). There was also informative coverage on supply normalization.

The second category, “Research on vaccines,” carried articles on mostly international investigations (n=48) in progress or related to the possible emergence of a new vaccine, as in the headline: “Vaccine paving the way against dengue” (Vacina, 2012). Among the news regarding research about other vaccines, however, those related to Ebola (n=8), AIDS (n=6), malaria (n=5), and influenza (n=4) stood out.

As a general line, the third category, “vaccination coverage” (n=36), gathered information on the number of immunized people, as well as the Portuguese Ministry of Health’s vaccination goals,

mainly against seasonal influenza, while also focusing on cases of low adherence to vaccination. This category closely relates to the “vaccination campaign” (n=31), which included subjects such as the calls to join the campaign, risk groups to be vaccinated, benefits, and the available supply of vaccines in the public network and pharmacies during the period.

As for the predominant approaches in the articles (tone applied), there was a significant variation ($\chi^2=103.740$; $p<.001$; $df=2$). Most articles presented either a positive (n=162) or neutral (n=117) tone in relation to vaccination (Table 5). In a positive tone, news such as the example below stood out: “DGS recommends the *flu shot*” (DGS, 2013) and, in a neutral tone: “Cancer vaccine” (Vaccine, 2016). Also, the frequency of negative texts was lower (n=21), highlighting, for example, possible adverse reactions from vaccines, as in the headline: “Meningitis vaccine associated with child death” (Vaccine, 2015).

When analyzing the evolution of the tone by year of study, it was found that 2017 included a greater number of positive articles (n=44) (Table 5). There was no significant variation in the neutral and negative articles throughout the study (neutral: $\chi^2=9,821$; $p=080$; $df=5$; negative: $\chi^2=9,000$; $p=.109$; $df=5$). 2014 was the year with the highest number of negative publications, while they were almost unnoticeable in 2016 and 2017 (n=1 for both years). We observed a decreasing trend in negative and an increase in positive articles, while neutral publications remained at similar values during the study period.

Table 5 – Distribution of the tone according to category per year of publication

	Year of publication	Tone used regarding vaccination			Total
		Positive	Neutral	Negative	
	2012	26	16	5	47
	2013	32	30	2	64
	2014	19	24	7	50
	2015	26	16	5	47
	2016	15	14	1	30
	2017	44	17	1	62
	Total	162	117	21	300

Discussion

The study assessed journalistic coverage about vaccines to understand how the subject has been presented in the Portuguese media. To achieve this purpose, we analyzed 300 articles related to vaccines in national newspapers, from 2012 to 2017, presenting a broad overview of this coverage.

Although the newspapers investigated gave vaccines some visibility, this was not a frequent front-page subject, only making it to the headlines when referring to some suspicion or risk related to vaccination, or when there were problems related to vaccines supply in the case of an outbreak, as was the case with measles. Concerning the journalistic genres, we were unable to identify editorials on the subject, which could be indicative that the newspapers did not take a stand regarding vaccination as a relevant preventive practice for Portuguese society.

The vaccine against influenza was the most cited in Portugal during the six years of study. The contagious disease has caused numerous deaths across the country, as well as in Europe as a whole. 4,467 people died of influenza during the outbreaks in 2016 and 2017, which may reflect the journalistic interest in the subject, given its high social impact. Both newspapers produced news about the vaccine based on data released by the Vacinômetro (Vacinometer), a project launched in 2009 by the Sociedade Portuguesa de Pneumologia to monitor the vaccine coverage against influenza across priority groups in real-time during the flu season (SPP, 2019). For example, *Diário de Notícias* made a public commitment to disclose the data provided by the entity during the influenza vaccination period, which is expressed through their journalistic coverage.

As for the subjects, those related to the vaccine supply, research on vaccines, as well as coverage and vaccination campaigns stood out. The category “vaccine supply” focused mainly on the shortages of vaccines available due to production issues, as happened with the BCG, provided by a laboratory in Denmark. The issue affected the Portuguese supply of the product, receiving further attention from the newspapers investigated between 2012 and 2016. The

vaccine was included in the national vaccination plan and should be administered in the first days of life. In June 2016, it was only made available for groups considered at risk, while there was no news related to BCG in 2017.

The lack of *flu shots* in pharmacies was also present in the news coverage. In Portugal, only seniors over 65, health professionals, and people suffering from specific diseases are vaccinated free of charge, while the rest of the population must buy the immunizer at pharmacies.

There was also informative coverage on the normalization of the supply, providing a follow-up on facts that had been previously reported. The fact that this was the most frequent topic of the articles is an indication that the investigated newspapers cover events that are closer to the population when addressing topics that reflect the need to ensure access to vaccination.

Most of the texts comprising the category “research on vaccines” were notes (33.3%), pointing to a limited supply of information available to the public regarding ongoing studies. In some cases, there was no data on the development process or even related to the body responsible for the research.

The news showed a preventive approach to the subject of “vaccination campaigns,” highlighting the role of immunization as the best way to prevent diseases. These findings are in line with Gomes and Lopes (2017; 2019), who identified that Portuguese generalist newspapers emphasize vaccination in their health news. Bear in mind, however, that the texts, comprised mostly of news and notes, were more objective and, in general, did not provide elaborate or explanatory information on vaccines.

The years concentrating the highest number of articles were 2013 (n=64) and 2017 (n=62) (Table 5). In 2013, besides the news regarding the deficient supply of immunizers, there was extensive coverage regarding the hard access to the vaccine against meningitis B, as well as on the discussion about its inclusion in the National Vaccination Plan. Other articles in evidence that year were related to the research against HIV/AIDS, with the beginning of clinical trials in the search for a vaccine against the disease.

Of the categories analyzed, “anti-vaccination movements,” “outbreaks/epidemics,” “discussions on mandatory vaccination,” and “prevention strategies” stood out in 2017, relating mainly to measles cases, which represented 50.06% of the texts published that year. Vaccine-preventable diseases generally received stronger media attention during outbreaks than at other times.

Portugal had not registered any cases of endemic measles transmission since 2004 (even though there have been ‘imported’ cases), which led the WHO to certify the measles had been officially eliminated in the country in 2015 and 2016. After 12 years, in 2017, Portugal faced an outbreak of the disease. 28 cases were confirmed between February and May of that year, of which 16 were not vaccinated (George et al., 2017). An unvaccinated teenager died, which sparked widespread media interest and coverage, fostering a discussion about whether vaccination should become mandatory. In Portugal, vaccination is not a practice imposed by the State, as it is understood as an act of citizenship, a right, and a duty of the people, who must be aware of the need to protect their own health, as well as public health. Other European countries, such as Italy and France, ended up adopting this measure concerning some vaccines in 2017, with the purpose of increasing immunization rates and reversing the situation (Bozzola et al., 2018).

Another subject that emerged that year concerned the anti-vaccination movement, which embraces misinformation as one of its main objectives (Gander, 2017). Some facts behind the production of such news were cases of people infected with measles who had not been vaccinated and debates on the reason why they refused to vaccinate.

The predominance of positive and neutral tones in the articles indicates that there was, on the part of newspapers, a look towards the valorization of immunization. The findings are similar to those of Catalan-Matamoros and Peñafiel-Saiz (2019b), as well as Cuesta-Cambra, Martínez-Martínez, and Niño-González (2019), who, when analyzing the Spanish media, found the predominance of a positive and neutral approach/neutral and positive, respectively, when analyzing news about vaccination.

Despite the small predominance of negative publications in the news coverage investigated,

we must consider that titles that draw attention to adverse reactions to vaccines, including those headlined, could contribute to an increasing distrust regarding the benefits and effectiveness of vaccines. This may happen as a result of the fact that people, in many cases, will not read the text in its entirety, dedicating time to read its title and/or first paragraph (lead), as they are the most visible. To attract readers, titles prioritize a certain focus, which does not always reflect the entire text (Catalan-Matamoros; Peñafiel-Saiz, 2019b). The news may even contrast opinions related to vaccination, but the fact that it highlights adverse reactions in the title could lead the reader to a distorted interpretation of the event, especially if they do not read the whole text. As Catalan-Matamoros (2015) points out, the media is part of this society and may unconsciously give rise to false beliefs, stereotypes, and stigmas.

Other news linked the aluminum hydroxide present in some vaccines with macrophagic myofasciitis (A Luta, 2015), however, only one source is included, related to the French association of patients with this disease, with no contrast of the information with any other medical or scientific source. This data is in line with Gomes and Lopes (2019) results when analyzing the sources of information in Portuguese newspapers, who found that “a large part of the texts does not even ensure the principle of contradiction and the plurality of perspectives on the that mediates itself” (Gomes; Lopes, 2019, p. 276).

Controversies related to vaccines have been more present in France since the beginning of the 1990s, motivated by the use of adjuvants in vaccines, as is the case of aluminum hydroxide and its supposed link with the disease (Fokoun, 2018). They are at the base of many of the arguments that support the anti-vaccination movements by linking vaccines to diseases; however, there is no consensus or solid scientific basis to support that vaccines containing aluminum can pose any health risk (WHO, 2008). The news about macrophagic myofasciitis also stands out for posing laboratories as archenemies, endorsing the low levels of trust in laboratories, which is a recurrent ingredient of conspiracy ideas.

The limitations of this study must be taken into account. We focused on two Portuguese newspapers;

therefore, our findings cannot be generalized, considering that the country has other daily newspapers, in addition to regional newspapers and weekly and monthly magazines, which could bring another configuration to the analysis on the coverage of vaccines. It would be relevant to perform a future investigation of other media, such as television, news sites, and the radio, as not all media broadcasts concepts and behaviors in the same way. Each speaker, as well as their audience, has their own characteristics (Sampaio, 2011). A study including a diversity of formats and audiences would enrich the analysis and contribute to a broader understanding of the investigated phenomenon.

The centrality and visibility that marked journalism in recent centuries have undergone transformations with the expansion of social networks. For many years, the media centralized the process of selecting the facts to be made public, however, this space is increasingly being occupied by social media, which enables the dissemination of a variety of information, discourses, and points of view. This study did not include an analysis of the Portuguese social networks, which could contribute to an investigation of the role that social media has been playing in the dissemination of unreliable information about vaccines. Cuesta-Cambra, Martínez-Martínez, and Niño-González (2019), for example, researched the communication of information about vaccination and anti-vaccination through the monitoring of news sites and social media. The authors found that Facebook groups about vaccines changed their profile over time, starting with the circulation of anti-vaccination news to become more neutral spaces where people could share their concerns. However, these groups did not rely on the participation of experts and tended to be either negative or fearful about vaccines.

Despite the significant presence of the media and social networks in the daily lives of the population, these are not necessarily the only source people rely on to gather information about immunizers. Other relevant factors, such as access to health services, perceptions of disease-related risks, and vaccine safety are also at play (Arriola et al., 2015). To understand a phenomenon as complex as the

hesitation to take the vaccines, qualitative studies should be carried out with interviews and focus groups, shedding light on parents' beliefs and attitudes towards understanding how this process of construction of distrust concerning vaccines and scientific institutions takes place. We must also bear in mind that parents who do not vaccinate their children or even have doubts regarding the subject are not necessarily part of the anti-vaccination movements, and such nuances should be considered in future investigations.

Final considerations

We may say that the newspapers investigated included the vaccines in their media agenda, very possibly influenced by the health policies present in Portugal, as pointed out by Gomes and Lopes (2019), also focusing on a positive perspective and the benefits related to immunization.

We hope that this study improves and expands knowledge concerning journalistic coverage of vaccines in non-Anglo-Saxon countries, as anti-vaccination movements are rampant in many countries and, therefore, there is a strong demand for further investigation of what kind of information the population receives regarding a preventive strategy which has been increasingly essential in public health.

These findings reinforce the perception that the media can be an instrument in the dissemination of reliable information about vaccines, also showing that public health institutions must pay further attention to communication strategies to prevent the proliferation of disinformation related to vaccination.

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Authors' contributions

Langbecker and Catalan-Matamoros conceived this study, defined the methodological design, and analyzed the data. Langbecker developed the theoretical discussion and wrote the article.

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