

# **Social media literacy program for 60+ in Brazil: Randomized control trial study – White paper**

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## **ABSTRACT**

This report presents a research which took place from May 5 to August 18, and involved 347 respondents, 60 years old and older. All the support was given by a partnership between MediaWise and Meta, which provided a course that lasted ten days long for all of the attendees. The goal of the course was to improve literacy in identifying misinformation, disinformation, and fake news and to improve the group's media literacy skills. The course was offered in several countries, via WhatsApp. In Brazil, Comprova Project was the sponsor and hub of the course. The subjects had daily classes via WhatsApp, in order to detect misleading content published on websites, social media, or applications such as WhatsApp and Telegram. The sample design, questionnaires, as well data analysis and results were undertaken by researchers from ESPM, partnered with AB Evne, a purveyor enterprise of surveys, on the data selection and questionnaire application. All funding was provided by Poynter Institute. The respondents were observed in two stages: before and after the course. In each stage a different questionnaire was applied. The first one was designed with the same structure as the questionnaire created by Stanford University. The second one presented six new headlines, and a few questions in order to evaluate the literacy improvement. Both of them were quantitative instruments. The main result was provided by a multinomial logistic regression that measures the odds ratio between the *success* in determining the nature of the information over having *no opinion*, and the *failure* in determining the nature of the information over having *no opinion*. As the main result, social media literacy skills in identifying misinformation, disinformation, truthful and fake news after the course was increased. Moreover, the increase in this skill is statistically significant.

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## 1. Introduction

MediaWise and Meta have been partnering to launch a course to help adult learners in Brazil to improve their digital media literacy skills, specifically adults older than 60 years old. The course was launched on March 30, 2022, and delivered to participants through WhatsApp.

For ten days, people who signed up for the course received daily a short piece of content on WhatsApp, such as a video or a text. The content was interactive, and it covered digital media literacy tips and tools, such as lateral reading, click restraint, algorithms, and reverse image search.

In order to conduct a randomized control trial study, Escola Superior de Propaganda e Marketing (ESPM), a private tertiary education center specialized in communication based in Sao Paulo) and the Poynter Institute (who manages the MediaWise program) designed the sampling process of the research. AB Evne, a survey purveyor company also based in Sao Paulo, collected data from the control group and the treatment group from May 5 to August 18, under the supervision of a group of ESPM researchers and analysts.

The research team determined that both groups (control and treatment) should reflect the stratification and specific characteristics of the Brazilian population over 60 years of age (60+). However, the definition of the sample also needed to be adjusted because of some practical limitations for the interviews. The main limitation was the absence of AB Evne offices in some Brazilian capitals. Thus, the collection took place in 18 capitals and the Federal District (where is the national capital, Brasilia).

Table 1 shows the number of inhabitants per location, according to IBGE<sup>1</sup> projections for the year 2020<sup>2</sup>. The percentage of the population over 60 years old in each location was obtained through the Social Policy Center of FGV Social<sup>3</sup>, which provides an online<sup>4</sup> platform with demographic data in each location where the survey purveyor AB Evne has an office. With a confidence of 95%, the margin of error for calculating the percentage of people 60+ was not greater than 5.32% (for more or for less). These calculations led to a sample projection of 340 elderly people in the control group.

AB Evne had a mailing full of elderly people and filtered them based on the protocol of interest. After this, AB Evne contacted people by phone. Few people were contacted personally. In the sequel, people received a link with the questionnaire which was prepared by using the *Gandia Integra*<sup>5</sup> tool. Since the elderly could have some difficulty in understanding the questionnaire that should be self-filled by each interviewee, and AB Evne gave them all support by phone. But people answered both questionnaires by

<sup>1</sup> Instituto Brasileiro de Geografia e Estatística (IBGE). The official Brazilian demographic statistics agency.

<sup>2</sup> The new Brazilian demographic census is currently being updated, so that the most up-to-date official data still refer to the year 2020.

<sup>3</sup> Fundação Getulio Vargas (FGV).

<sup>4</sup> Panorama dos Idosos Brasileiros - Quem são? Onde estão? O que fazem? Como chegar até eles? Retrieved from: <https://www.cps.fgv.br/social/4/evolucaoBRATOTHIBcodpanorama/visualizacao/tudo>.

<sup>5</sup> More information at: <https://www.tesibr.com/>.

themselves. AB Evne did not provide any identifiable or contact information for the participants with ESPM.

**Table 1**

*First draft of demographic stratification<sup>6</sup>*

REG	UF	City	Pop_2020	Perc_60+_2018	Pop_elders	Total
N	AM	Manaus	2,219,580	11.08	245,929	11
N	MA	São Luís	1,108,975	13.31	147,605	7
N	PA	Belém	1,499,641	15.23	228,395	10
NE	CE	Fortaleza	2,686,612	14.79	397,350	18
NE	RN	Natal	890,480	15.84	141,052	7
NE	PI	Teresina	868,075	12.71	110,332	5
NE	BA	Salvador	2,886,698	14.51	418,860	19
NE	PB	João Pessoa	817,511	14.5	118,539	6
NE	PE	Recife	1,653,461	15.46	255,625	12
CO	DF	Distrito Federal	3,055,149	12.07	368,756	17
CO	GO	Goiânia	1,536,097	17.01	261,290	12
CO	MT	Cuiabá	618,124	16.08	99,394	5
SE	RJ	Rio de Janeiro	6,747,815	20.81	1,404,220	62
SE	SP	São Paulo	12,325,232	17.36	2,139,660	94
SE	MG	Belo Horizonte	2,521,564	16.57	417,823	19
SE	ES	Vitória	365,855	17.39	63,622	3
S	RS	Porto Alegre	1,488,252	19.52	290,507	13
S	PR	Curitiba	1,948,626	17.23	335,748	15
S	SC	Florianópolis	508,826	18.26	92,912	5
Total			45,746,573		7,537,621	340

## 2. First phase

The data collection process was planned to take place in two steps. In the first one, a questionnaire was applied to characterize the sample, describing the degree of familiarity that interviewee has with the digital environment and how exposed he/she is to technological tools or platforms.

In the first questionnaire, respondents should read 6 news headlines, based on the same structure of the Stanford's questionnaire used by the researchers who carried out the American inquiry that followed the digital literacy program carried out in the US by MediaWise and Meta.

Some of those headlines represented false information while some of them were true. The order and the total number of false and true news stories were completely random.

<sup>6</sup> REG=Region (N=North; NE=Northeast; S=South; SE=Southeast; CO=Center-West); UF (Units of the Brazilian Federation=States).

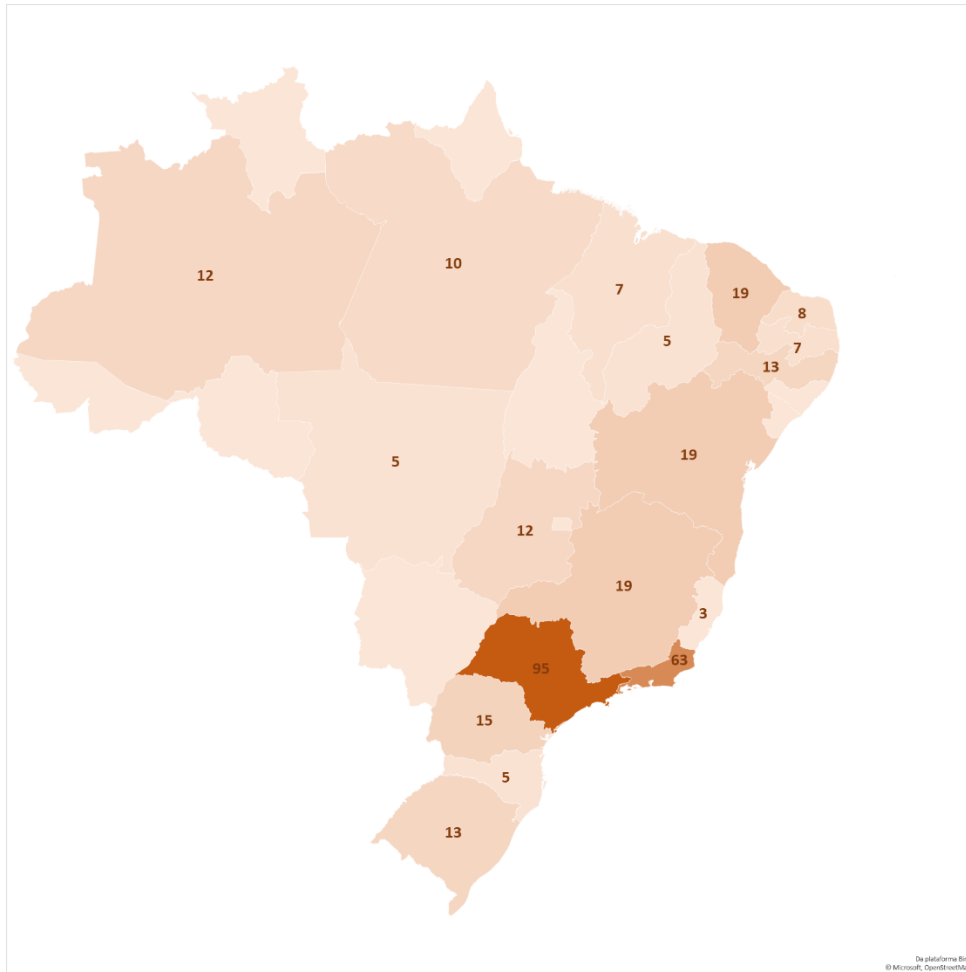
Each interviewee was tasked with answering how much the news tended to be true or false - from definitely false to definitely true.

## 2.1 Sample characterization

Figure 1 shows the total number of respondents in each Brazilian capital, after applying the first questionnaire for data collection. Only 17 respondents from the Federal District do not appear in the following table. A total of 347 people participated in the first phase of the survey. The darker the color of the map, the greater the number of respondents participating in the survey in each Brazilian state (or UF= unit of Federation).

**Figure 1**

*First phase – control group (n = 347 elders)*

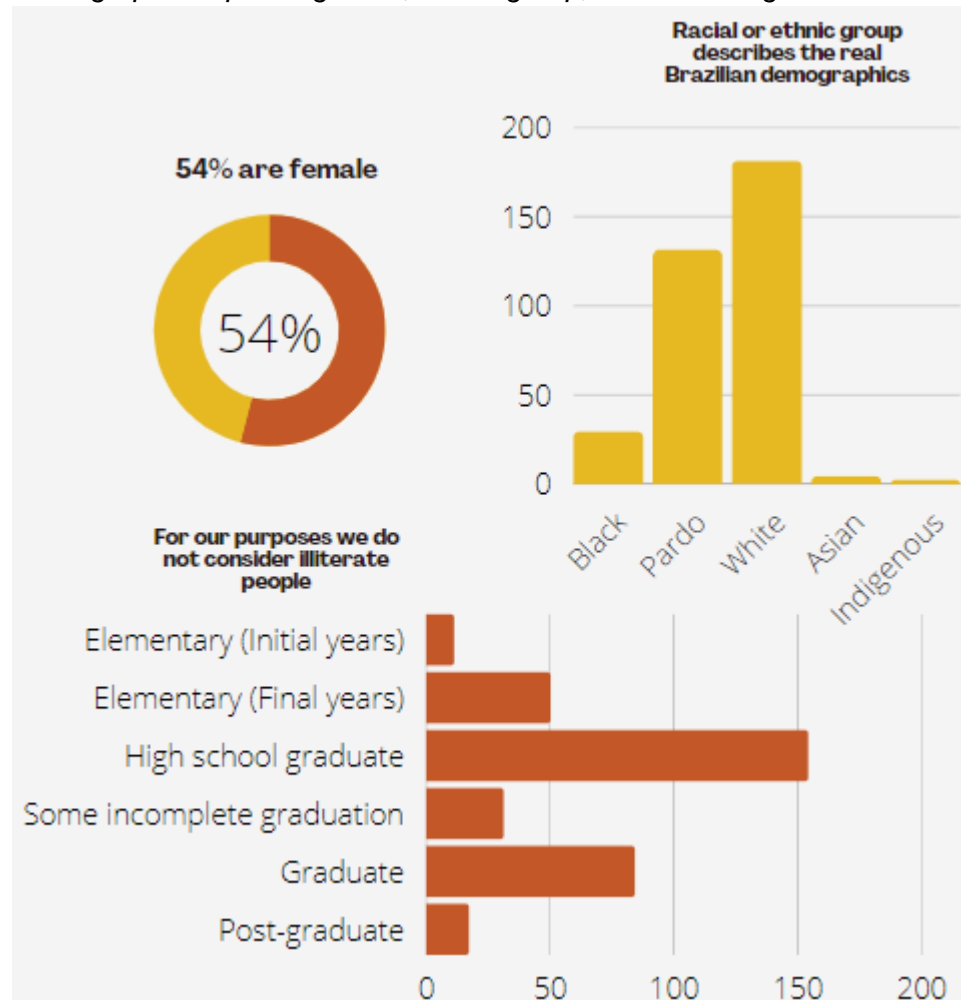


The sample of 347 people is characterized as follows (Figure 2):

- Gender: 54% of respondents are women.
- Racial or ethnic group: Black (8%); Brown (38%); White (52%); Asian (1%); Indigenous (1%).
- Schooling: elementary school – initial years (from year 1 to year 5) (3%); elementary school – final years (from year 6 to year 9) (14%); high school (44%); tertiary education – undergraduate (9%); tertiary education - graduate (24%); postgraduate (5%).

**Figure 2**

*Demographic aspects: gender, ethnic group, and schooling*



As the access to the information requires schooling, illiterate elderly people were not part of the research sample.

It was also necessary to reckon the interviewees according to religion and income, considering the same proportionality of these criteria in the Brazilian population.

For the percentages referring to religion, the sample was based on the information released on 01/13/2020 by G1 Portal referring to a survey carried out by the Datafolha Institute (a research institute owned by Folha de S. Paulo newspaper). As for the control of different economic classes, Neri (2019) discusses the subjectivity in traditional Brazilian instruments of economic stratification, following a literature based on the concept of social well-being.

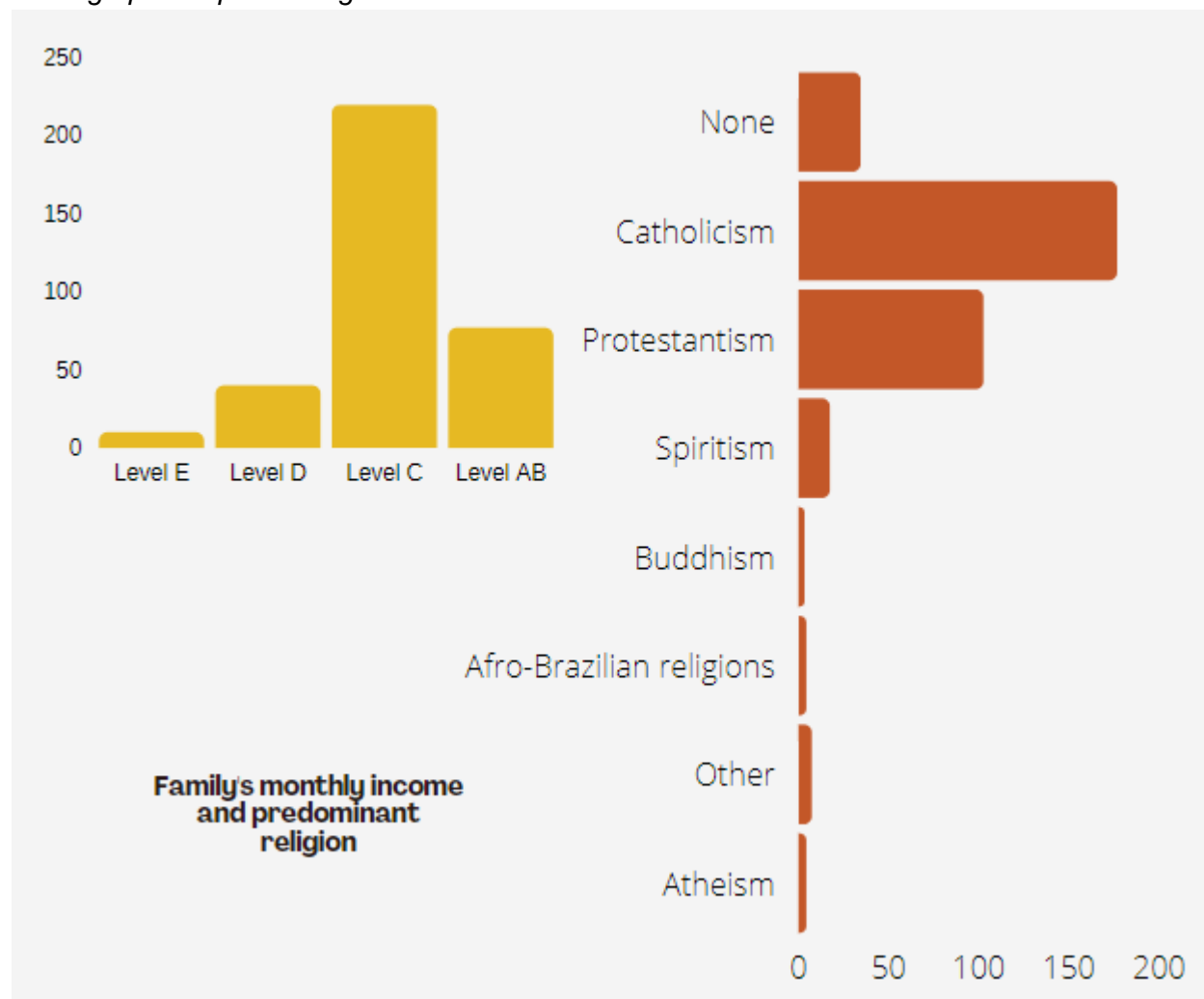
As it is already very well known, the criteria based on income only consider the situation of the economically active population. Because of that, the data often omit information about the 60+, who are, in many cases, already enjoying their pensions.

In this scenario, the following income brackets were adopted for the stratification of the 60+ population, adapted from the methodology used by the Social Policy Center of FGV Social:

- Class (Level) E: up to one Brazilian minimum wage, that is, up to R\$ 1,212.00;
- Class (Level) D: from one up to two Brazilian minimum wages, that is, from R\$ 1,212.01 up to R\$ 2,424.00;
- Class (Level) C: from two Brazilian minimum wages up to the maximum value paid by the public pension system (INSS), that is, from R\$ 2,424.01 up to R\$ 7,087.22;
- Class (Level) AB: more than the maximum payment by INSS, that is, over R\$ 7,087.22.

Figure 3 illustrates the frequency distributions of the income and religion criteria obtained under control in the sample.

- predominant religion: None (10%); Catholicism (51%); Protestantism (29%); Spiritism (5%); Buddhism (1%); Afro-Brazilian religions (1%); Other (2%); Atheism (1%).
- family's monthly income: Level E (3%); Level D (12%); Level C (63%); Level AB (22%).

**Figure 3***Demographic aspects: religion and household income*



## 2.2 Exposure to technology

In order to measure the exposure of the Brazilian elderly to the digital environment and some technologies, the interviewees were asked to point out how often they connect to the internet from any location (at home, at work, in transit or anywhere else). The result was that 236 of the 347 respondents (68%) said they “always” use the internet.

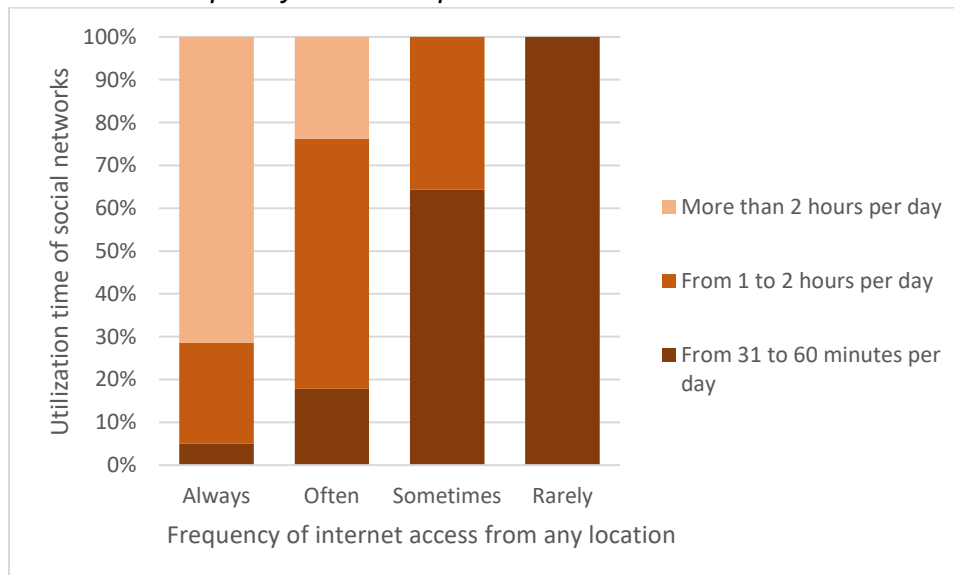
A total of 175 amongst the 347 respondents (50%) responded that they spend, on average, more than two hours browsing social media, such as Facebook, Twitter, or Instagram.

Figure 4 reveals the possible relationship that the interviewee established between the frequency of connection and the time he/she spends on social media, since it is evident that this exposure increases as the frequency of connection to the internet of any place goes up.

The chi-square test was used to measure the significance of this association. First of all, we observed that nobody answered that “rarely” connects to the internet, so that this category of response was eliminated from the analysis. The chi-square test obtained a p-value ( $<0.001$ ) favorable to the association of time of internet connection and exposure to the social media platforms. This result indicates that the elderly who access the internet more frequently also spend more time on social media and vice versa.

**Figure 4**

*Connection frequency and time spent on social media*



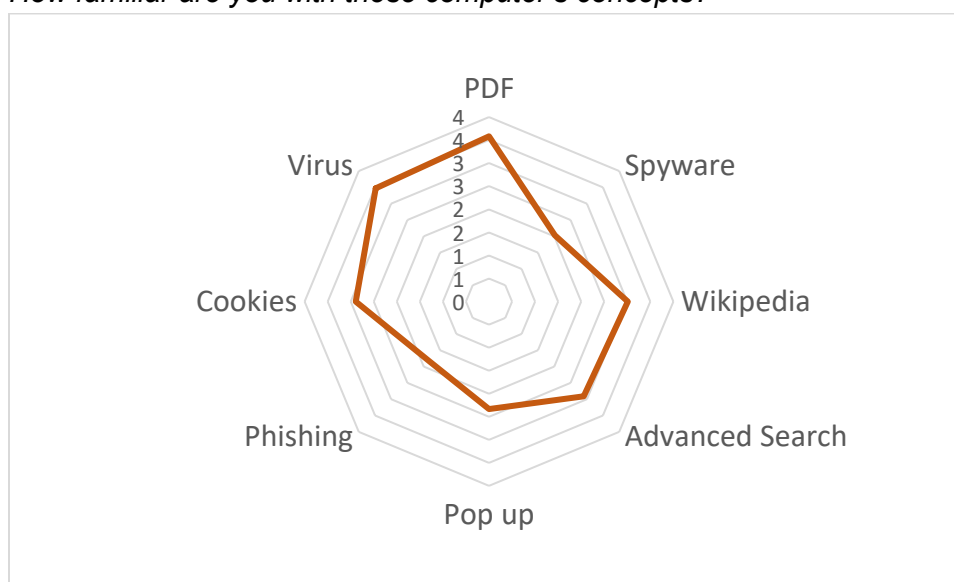
In addition, the interviewees were asked how much they knew about the terms like PDF, spyware, Wikipedia, advanced search, pop up, phishing, cookies and viruses, as well as

how much they knew about advertising and news targeting, content produced on Wikipedia, anxiety about clicking on anything they read (click restraint), reverse image search, side search, algorithms that drive news and advertising, and their understanding of what “accepting cookies” would be.

Figure 5 reveals that the terms PDF, virus, and Wikipedia are the most known amongst the 60+ population, while pop up, spyware and phishing are the least known terms, both ranked in descending order of knowledge.

**Figure 5**

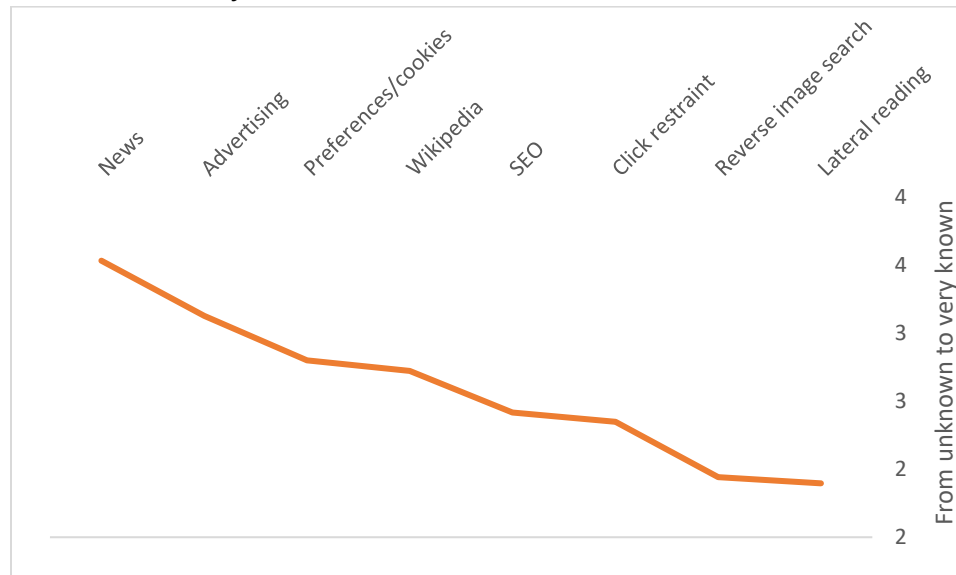
*How familiar are you with these computer's concepts?*



The 60+ population also needed to assess their knowledge of some digital techniques. Some of them such as SEO, Click Restraint, Reverse Image Search and Lateral Reading were part of the content of the digital media literacy course that was offered to respondents in the second phase of the study.

**Figure 6**

*How familiar are you with each of these internet-related items, and tools of digital literacy?*



The techniques exposed in the MediaWise course are the least known by the 60+ Brazilian interviewees, as shown in Figure 6. The deficit in digital knowledge among the 60+ population is a first good reason to offer a social media literacy program aimed at an audience of this demographic stratum in Brazil.

These results corroborate the studies by Machado et al. (2019)<sup>7</sup>, who mapped and analyzed the digital competence of 24 elderly people aged 60+ who participated in a course offered by the Digital Inclusion Unit (UNIDI) of the Federal University of Rio Grande do Sul (UFRGS), in the South Region of Brazil. The authors considered that the elderly still have many limitations related to the skills of literacy and digital fluency, but they have positive attitudes once they look for solutions to these barriers. They concluded that it is necessary to create and apply new pedagogical strategies to solve these difficulties, such as the use of digital educational materials.

Gil (2019)<sup>8</sup> also argues that those strategies must target the elderly so that they feel digitally and socially included. In this perspective, Slodkowski et al. (2021)<sup>9</sup> comment on the importance of the elderly building digital skills to insert themselves in society in an affirmative way.

<sup>7</sup> Machado, Leticia Rocha et al. (2019). *Competência Digital de Idosos: Mapeamento e Avaliação*. Educação Temática Digital. 21(4), p.941-959. Retrieved from: <https://doi.org/10.20396/etd.v21i4.8652536>.

<sup>8</sup> Gil, H. (2021). *Nativos Digitais, Migrantes Digitais e Adultos Mais Idosos: pontes para a infoinclusão*. Educação, Psicologia e Interfaces. Lisboa: 3(2), p. 163-183. Retrieved from: <https://doi.org/10.37444/issn-2594-5343.v3i2.152>.

<sup>9</sup> Slodkowski, B.K. et al. (2021). *Autoria e competência digital de idosos: uma revisão sistemática da literatura acerca dos conceitos*. Revista Educar Mais. Porto Alegre: 5(4), p. 805 - 820. Retrieved from: <https://doi.org/10.15536/reducarmais.5.2021.2452>.

Araújo da Silva and Behar (2019, p. 26)<sup>10</sup> ponder that the society usually expects a digitally competent person to understand the technological means in order to “know how to use information, be critical and be able to communicate using a variety of tools”.

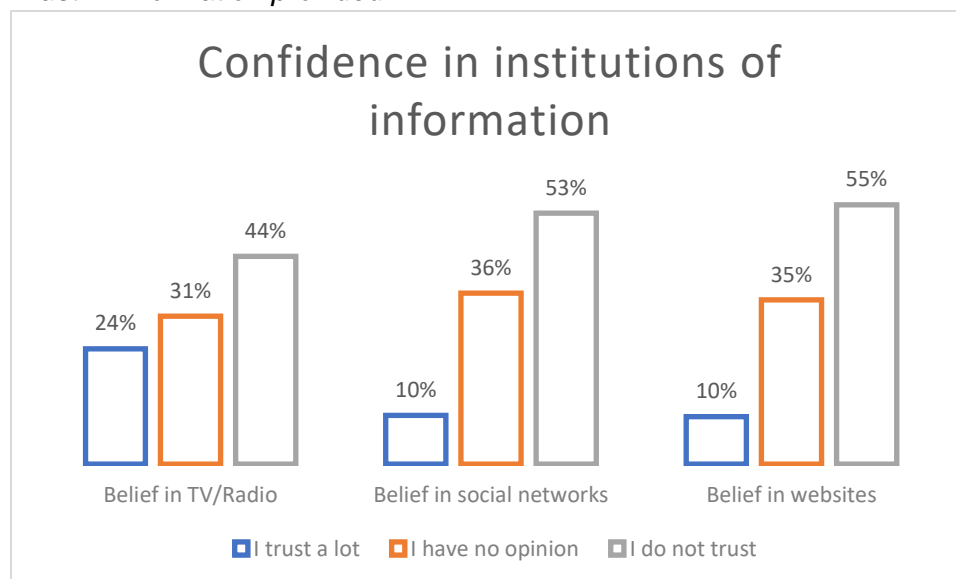
### 2.3 Understanding fake news

To describe the confidence of the 60+ population in the content broadcast by different channels or shared by themselves, some questions were raised, and the results appear in Figures 7 and 8.

As shown in the following graphic, around 30% of the respondents did not know how to give an opinion about the confidence on what is broadcast on social networks and on the internet.

**Figure 7**

*Trust in information provided*



Among those who expressed an opinion, 24% believe that TV and radio are the channels in which the content is reliable most of the time. This percentage drops to approximately 10% when it comes to social networks and websites (Figure 7).

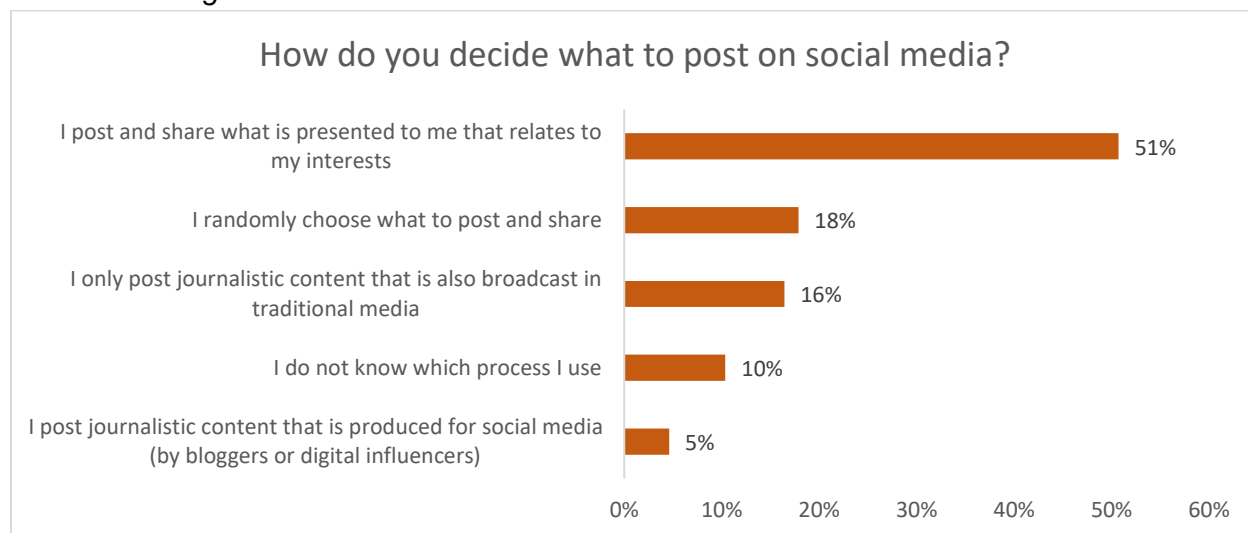
<sup>10</sup> Araújo da Silva, K. K; & Behar, P. A. (2019). *Competências Digitais na Educação: uma discussão acerca do conceito*. Educação em Revista. 35. Retrieved from: <https://doi.org/10.1590/0102-4698209940>.

This result coincides with data previously obtained by the Digital News Report 2022 – Reuters Institute/Oxford University (Eddy & Fletcher, 2022)<sup>11</sup>, which points out that television still has a strong audience in Brazil. As an example, the report informs that Brazilians followed the news about the Russia-Ukraine conflict mostly through television (44%), followed by social media (23%). Online: news sites + non-mainstream sites + social (41%). But radio only 2%. However, the research also notes that traditional media such as TV and print media have declined significantly over the past decade and the use of smartphones for news consumption has increased rapidly.

In 2020, a survey carried out by Datafolha (Marques, 2020)<sup>12</sup> and published in the Folha de S.Paulo newspaper also showed that TV channels were pointed out as the most reliable media in disseminating information during the coronavirus crisis, while social media and messaging apps were seen as unreliable amid the pandemic. The results showed the following percentages: TV news programs (61%); printed newspapers (56%); radio news programs (50%) and journalistic websites (38%). According to the same survey, 18% of people 60+ and less educated (up to elementary school) said they trust the information about the pandemic received through WhatsApp and 17% through Facebook. However, these strata also trust the professional media more.

**Figure 8**

*Content sharing decision*



<sup>11</sup> Eddy, K; & Fletcher, R. (2022). *Perceptions of Media Coverage of the War in Ukraine*. Brazil|Reuters Institute for the study of journalism. Retrieved from: <https://reutersinstitute.politics.ox.ac.uk/digital-news-report/2022/perceptions-media-coverage-war-Ukraine>

<sup>12</sup> Marques, J. (2020). *TVs e jornais lideram índice de confiança em informações sobre coronavírus*. Datafolha. Folha de S.Paulo. Retrieved from: <https://www1.folha.uol.com.br/poder/2020/03/tvs-e-jornais-lideram-indice-de-confianca-em-informacoes-sobre-coronavirus-diz-datafolha.shtml>.

Regarding the topics that the elderly themselves decide to publish on social media, 51% of respondents informed that they only post what is related to their own interests, as shown in Figure 8. Similarly, this audience prefers to receive content that shares their point of view (Figure 9).

According to the Oxford-Brazil EBM Alliance<sup>13</sup>, “confirmation bias occurs when an individual seeks and uses information to support their own ideas or beliefs. It also means that information that does not support your ideas or beliefs is disregarded.”

This is a mechanism that gained great repercussions in times of disinformation, especially in the political sphere, due to the strong tendency of voters to believe in information received that favors their candidate without examining it and sharing it, whether it is true or false. Therefore, confirmation bias occurs when information confirms the pre-existing opinion of a person who shares it without researching its origin. Regarding this analysis, it is worth mentioning that our research was applied in the run-up to official campaigns of candidates for elections in Brazil in 2022.

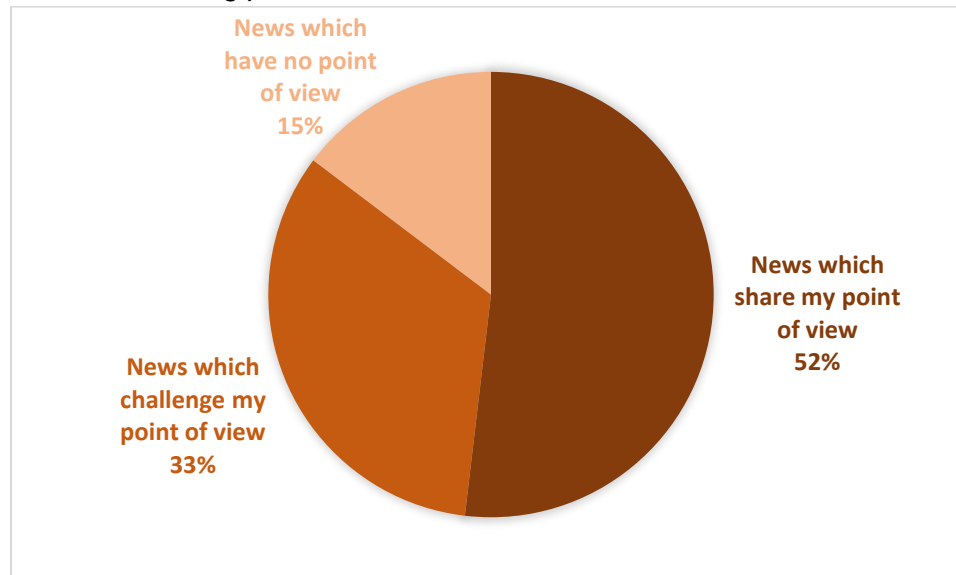
The UNESCO Manual for Education and Training in Journalism<sup>14</sup> presents the Encyclopedia Britannica definition of confirmation bias as: “the tendency to process information that is consistent with existing beliefs. This biased approach to decision making is largely unintentional and often results in ignoring inconsistent information. Existing beliefs can include a person's expectations in a given situation and predictions about a specific outcome. People are especially likely to process information to support their own beliefs when the issue is highly important or relevant to themselves.”

The concept of confirmation bias was given by Israeli psychologists Daniel Kahneman and Amos Tversky in the 1970s. The results of this research, presented in Figures 8 and 9, comprise studies on confirmation bias conceptualized by those researchers.

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<sup>13</sup> Oxford-Brazil EBM Alliance. Retrieved from: <https://oxfordbrazilebm.com/index.php/vies-de-confirmacao/>.

<sup>14</sup> Manual para Educação e Treinamento em Jornalismo da Unesco. Retrieved from: <https://unesdoc.unesco.org/ark:/48223/pf0000368647>.

**Figure 9***Content receiving preferences*

Respondents were also asked on which channel they were subjected to more false information. Social media platforms were the most mentioned, as shown in Figure 10.

**Figure 10***Where do you believe you encounter the most amount of false information?*

This result is again in line with the Digital News Report 2022 (Newman et al., 2022)<sup>15</sup>, which shows people's concern about the information they receive through social media.

The Reuters / Oxford's report informs that, across all countries where the survey was carried out, 54% of people are concerned with knowing how to differ real and false information on the internet when it comes to news, and those who primarily use social media are still more concerned (61%) than people who don't use it (48%). Latin America

<sup>15</sup> Newman, N. *et al.* (2022). *Digital News Report 2022*. Instituto Reuters/Oxford University. Retrieved from: <https://static.poder360.com.br/2022/06/Digital-News-Report-2022-Reuters.pdf>.

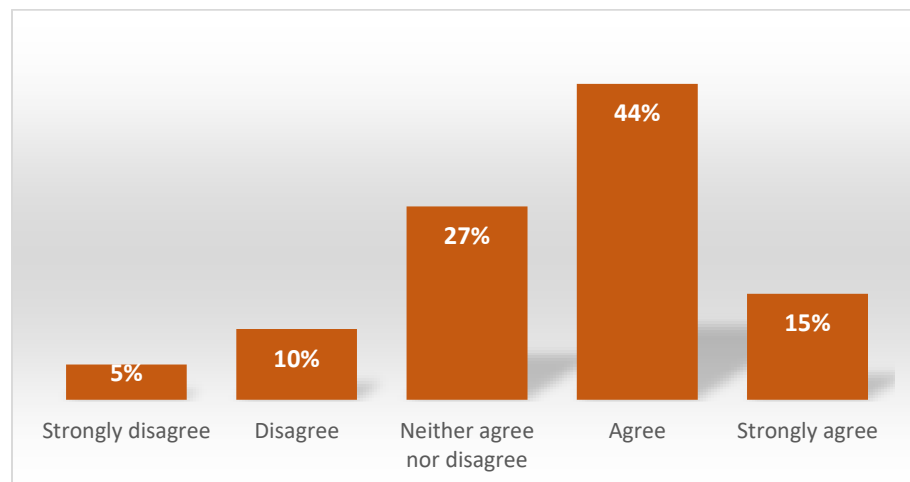
is one of the regions where this concern is the highest. Also, according to the report, 64% of people receive news through social media each week and use a wide range of digital platforms. The authors ponder that it does not mean that the use of social media is the cause of disinformation, but they can work as an open window for the exposure to it.

In our research, we also draw the respondents' attention to topics that are largely discussed in legacy media – related to political and social events such as the 9/11 attack, Lady Diana's death, Ukraine and Russia War etc. The aim of this approach was to find out what elders think about the "official version" of such events that is broadcast by the media. One of the assumptions was that the interviewees could imagine this "official version" was part of a hypothetical secret plan fabricated by a covert alliance of powerful individuals or organizations, such as secret services or the Government.

The same strategy was proposed by Stanford University in the questionnaire applied to Americans on the US chapter of MediaWise research.

**Figure 11**

*"Official versions" of the events often hide the truth*



The sum of those who agree or totally agree that there is a "real" version beneath the official one, equals 58.50%. This is a very expressive value that needs to be discussed.

The scenario presented in Figure 11 refers to some issues that are induced by conspiracy movements that, over the last few years, have been present mainly in group discussions on social media that seek to deny the official versions of facts published by news outlets.

"The Conspiracy Theory Handbook", written by professors Stephan Lewandowsky (University of Bristol) and John Cook (George Mason University), provides important information about it. According to the authors, social media sites can potentially reach as many people as traditional media. Without a moderator in the conversation, it is even easier for online disinformation to spread faster than true information. For researchers, conspiracy theories are not always the result of genuinely false beliefs. They can be intentionally constructed or amplified for strategic and political reasons.

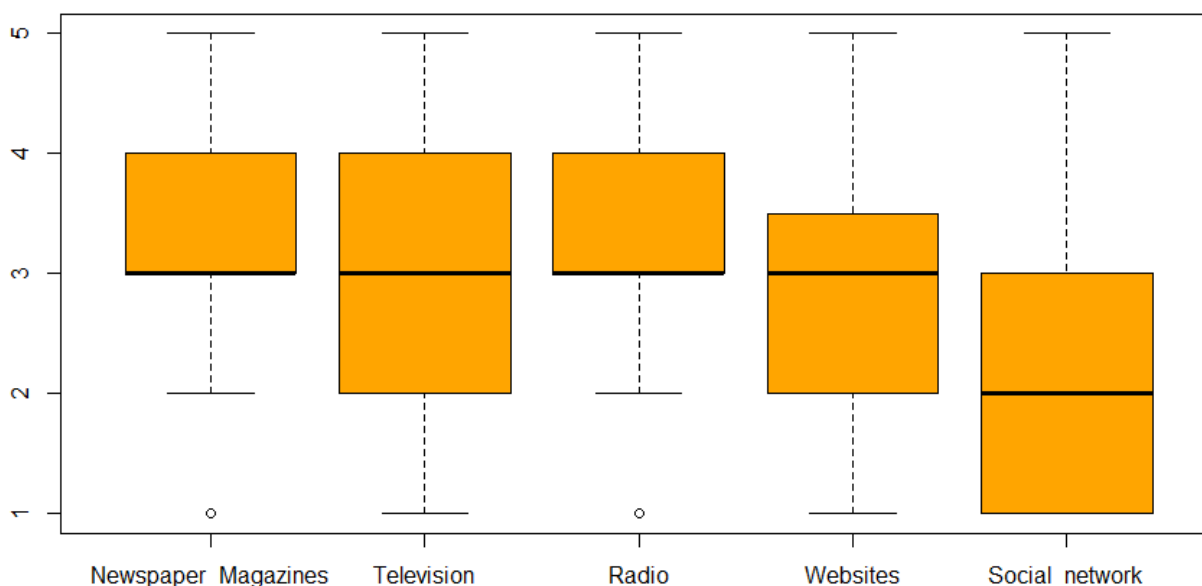


As stated by Lewandowsky and Cook: “Conspiracy theorists can simultaneously believe in ideas that are mutually contradictory. To believe, for example, in the theory that Princess Diana was murdered, while accepting that she faked her own death. This is because theorists’ commitment to disbelief in the ‘official’ narrative is so absolute that it doesn’t matter if the belief system is incoherent.”<sup>16</sup>

Still, according to the authors, real conspiracies do exist, however, the mechanisms of conspiratorial thinking are not the best way to discover actual conspiracies. Conventional thinking, yes, is one that values healthy skepticism, evidence and coherence and has the elements needed to identify real attempts to mislead the audience.

**Figure 12**

*Trust in information broadcast in Brazil*



Finally, Figure 12 presents how much confidence the interviewees showed in different mass media in Brazil. This question suggested that the respondents analyze Brazilian media. As all media was presented altogether, at the end, respondents rank them from the least to the most reliable, according to their perception.

The main difference between the results shown in Figure 7 and in Figure 12 is the issue described: in Figure 12, interviewees were asked about what has been broadcasted in Brazil; on the other hand, Figure 7 presents the confidence in information institutions, regardless of having been broadcast in Brazil.

<sup>16</sup> Lewandowsky, S.; & Cook, J. (2020). *O Manual das Teorias da Conspiração*. Retrieved from: <http://sks.to/conspiracy>.

According to Figure 12, magazines and printed-based outlets, as well as radio, are perceived as the most reliable by at least 50% of respondents who indicated values 3, 4 or 5 on the Likert scale.

In this scenario, television and websites appear with intermediate confidence. Social media was mentioned in the last position among the different types of media.

On the other hand, the world is moving from paper-based to digital outlets. This is the trend around the world, and elderly people need to be ready for this new way of life. According to Folha de S.Paulo (Robertson, 2022)<sup>17</sup>, The New York Times increased about 180 thousand new digital subscribers only in the second semester of 2022. This amount is 70% greater than the amount of subscribers in the same period of 2021. Currently, the newspaper has 9.17 million subscribers. The target is to reach 15 million by the end of 2027.

That also is the trend in Brazil, where the number of paper-based subscribers has also decreased. Digital News Report 2022 (Carro, 2022)<sup>18</sup> points that, in the first two months of 2022, the number of digital subscriptions accounted for 59% of the circulation of Brazil's ten best-selling newspapers, and this number can reach 67% by the end of 2022.

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<sup>17</sup> Robertson, K. (2022). *New York Times relata ganho de 180 mil assinantes digitais*. Folha de S.Paulo. Retrieved from: <https://www1.folha.uol.com.br/mercado/2022/08/new-york-times-relata-ganho-de-180-mil-assinantes-digitais.shtml>.

<sup>18</sup> Carro, R. (2022). *Media ownership remains highly...* Brazil | Reuters Institute. Oxford University. Retrieved from: <https://reutersinstitute.politics.ox.ac.uk/digital-news-report/2022/brazil>.

## 2.4 Identification of false information – phase 1 (control group)

The six news that were randomly presented to each interviewee took into account a specific time frame. Two were news from 2022 (Headlines 1 and 4), two from 2020 (Headlines 2 and 3) and two were related to facts that happened more than five years ago (Headlines 5 and 6).

For each pair of news, one was true and the other was false.

Two news items with pictures were inserted to check if any interviewee would use the Reverse Image Search technique.

### 2.4.1 Headline 1: true information from 2022

**Russia x Ukraine: images show Russian vessel Moskva supposedly in flames**



Images that have been circulating via messaging application Telegram show Russian vessel Moskva supposedly in flames, according to information divulged in an Ukrainian channel broadcasting news on the Russia-Ukraine war. No country has confirmed that the images really refer to the ship, but there is a narratives' war over the reason why it's sunk. Ukraine claims that the vessel sank after a missile attack. Russia, on the other hand, states that the shipwreck occurred due to a fire caused by the ammunition explosion on board.

**Table 2**

*Headline 1: evaluation versus confidence*

	<b>CERTAINLY</b>	<b>I DO NOT KNOW</b>	<b>NOT SURE</b>	<b>Total</b>
FALSE	<b>9%</b>	8%	18%	35%
I DO NOT KNOW	8%	12%	4%	24%
TRUE	<b>36%</b>	3%	3%	41%
<b>Total</b>	<b>53%</b>	<b>22%</b>	<b>25%</b>	<b>100%</b>

Although this piece of news was true, 9% said they were sure that it was false information. Even among those who said they already knew about the sinking of the Moskva ship, 7% answered that they were sure that the news was false (Table 3).

**Table 3***Headline1: more information*

Did you do any research?				
Have you seen this headline before?			No	Total
	<b>Yes</b>			
Yes	<b>9%</b>		48%	<b>58%</b>
No	3%		40%	42%
<b>Total</b>	<b>12%</b>		<b>88%</b>	<b>100%</b>
Did you find the original article?				
Have you seen this headline before?	Yes	No	No	Total
Yes	<b>7%</b>	2%	48%	<b>58%</b>
No	1%	2%	40%	42%
<b>Total</b>	<b>8%</b>	<b>3%</b>	<b>88%</b>	<b>100%</b>
Not the original but other related texts?				
Have you seen this headline before?	Yes	No	No	Total
Yes	<b>5%</b>	4%	48%	<b>58%</b>
No	1%	1%	40%	42%
<b>Total</b>	<b>7%</b>	<b>5%</b>	<b>88%</b>	<b>100%</b>
Did you use reverse image search?				
Have you seen this headline before?	Yes	No	No	Total
Yes	<b>5%</b>	5%	48%	<b>58%</b>
No	1%	2%	40%	42%
<b>Total</b>	<b>5%</b>	<b>7%</b>	<b>88%</b>	<b>100%</b>

As shown in Table 3, 58% of the elderly reported that they had already known about the news and 12% decided to do some research before informing their answers. Among them, 8% found the original text. Digital tools to find the truth, such as related texts and reverse image search, were little used by the interviewees.

## 2.4.2 Headline 2: true information from 2020

### Carrefour implants Cielo service to accept emergency aid Carrefour Group is the first retailer to implement the novelty

What with the crisis caused by the coronavirus pandemic, millions of Brazilians are unable to work and will be paid the Federal Government's emergency aid for three months. TO help these people, Cielo, the largest electronic payment company in Brazil, has adapted a model of board machine that can accept Caixa's online debit card, which is available to those without a bank account.

**Table 4**

*Headline 2: evaluation versus confidence*

	<b>CERTAINLY</b>	<b>I DO NOT KNOW</b>	<b>NOT SURE</b>	<b>Total Geral</b>
FALSE	<b>12%</b>	4%	18%	35%
I DO NOT KNOW	4%	11%	4%	19%
TRUE	<b>42%</b>	4%	1%	47%
<b>Total</b>	<b>58%</b>	<b>18%</b>	<b>24%</b>	<b>100%</b>

Even though it is also true, 12% of respondents asserted with certainty that the headline 2 was fake, as shown in Table 4.

**Table 5**

*Headline 2: more information*

Did you do any research?				
Have you seen this headline before?	<b>Yes</b>		<b>No</b>	<b>Total</b>
Yes	7%		28%	<b>35%</b>
No	7%		57%	65%
<b>Total</b>	<b>14%</b>		<b>86%</b>	<b>100%</b>
Did you find the original article?				
Have you seen this headline before?	<b>Yes</b>	<b>No</b>	<b>No</b>	<b>Total</b>
Yes	5%	2%	28%	<b>35%</b>
No	2%	5%	57%	65%
<b>Total</b>	<b>7%</b>	<b>7%</b>	<b>86%</b>	<b>100%</b>
Not the original but other related texts?				
Have you seen this headline before?	<b>Yes</b>	<b>No</b>	<b>No</b>	<b>Total</b>
Yes	<b>4%</b>	3%	28%	<b>35%</b>
No	4%	3%	57%	65%
<b>Total</b>	<b>8%</b>	<b>6%</b>	<b>86%</b>	<b>100%</b>

The second piece of news seemed familiar to 35% of respondents and 14% said they did some research before answering the question.

Among those who did some research, 7% said they had found the original article; 4% knew about the news and found other texts related to it.

### 2.4.3 Headline 3: false information from 2020

**Television declares war on satellite dish manufacturers and stops signal in the countryside.**



Some satellite dish manufacturing companies were accused of animal cruelty and, with no forewarning, as of January 14th, the Government has stopped digital TV open signal provided for spectators who use satellite dishes across Brazil, especially in the countryside and rural areas.

**Table 6**

*Headline 3: evaluation versus confidence*

	<b>CERTAINLY</b>	<b>I DO NOT KNOW</b>	<b>NOT SURE</b>	<b>Total</b>
FALSE	<b>29%</b>	6%	29%	64%
I DO NOT KNOW	3%	12%	5%	20%
TRUE	<b>14%</b>	1%	1%	16%
<b>Total</b>	<b>46%</b>	<b>19%</b>	<b>36%</b>	<b>100%</b>

Here, the text has been modified so that the headline represents false information. Even so, Table 6 reveals that 14% of respondents said with certainty that the fact in the news was true.

**Table 7***Headline 3: more information*

Did you do any research?				
Have you seen this headline before?	Yes		No	Total
Yes	4%		16%	20%
No	6%		73%	80%
<b>Total</b>	<b>10%</b>		<b>90%</b>	<b>100%</b>
Did you find the original article?				
Have you seen this headline before?	Yes	No	No	Total
Yes	2%	2%	16%	20%
No	2%	4%	73%	80%
<b>Total</b>	<b>4%</b>	<b>6%</b>	<b>90%</b>	<b>100%</b>
Not the original but other related texts?				
Have you seen this headline before?	Yes	No	No	Total
Yes	2%	3%	16%	20%
No	3%	3%	73%	80%
<b>Total</b>	<b>4%</b>	<b>6%</b>	<b>90%</b>	<b>100%</b>
Did you use reverse image search?				
Have you seen this headline before?	Yes	No	No	Total
Yes	1%	3%	16%	20%
No	1%	5%	73%	80%
<b>Total</b>	<b>2%</b>	<b>8%</b>	<b>90%</b>	<b>100%</b>

On the other hand, Table 7 indicates that the vast majority of respondents (80%) had not known the original news before the interview and only 10% did some research before answering the question. Only 4% of the respondents confirmed having found the original text, but most probably having not entirely read it. A minority responded that they had found related texts or had done reverse image search in order to check the veracity of the news.

#### 2.4.4 Headline 4: false information from 2022

##### Russia's Prime-Minister Putin declares he did not want war, but was forced into it

Russia's Prime-Minister Putin claims he did not want war, but was forced into it because, if he hadn't declared it, he would have been attacked but the Ukrainians, allied to the US. This statement was released after hundreds of Russian soldiers were killed by Ukrainian troops in the city of Warsaw.

**Table 8**

*Headline 4: evaluation versus confidence*

	<b>CERTAINLY</b>	<b>I DO NOT KNOW</b>	<b>NOT SURE</b>	<b>Total</b>
FALSE	<b>26%</b>	5%	26%	57%
I DO NOT KNOW	2%	11%	3%	16%
TRUE	<b>24%</b>	2%	1%	28%
<b>Total</b>	<b>52%</b>	<b>18%</b>	<b>30%</b>	<b>100%</b>

The answers related to headline 4 show a worrying result once 24% asserted with certainty that the information was true, even though it was false. The difference between those who identified that the news was false (26%) was very small, as shown in Table 8.

**Table 9**

*Headline 4: more information*

Did you do any research?				
Have you seen this headline before?	<b>Yes</b>		<b>No</b>	<b>Total</b>
Yes	8%		43%	<b>50%</b>
No	4%		46%	50%
<b>Total</b>	<b>12%</b>		<b>88%</b>	<b>100%</b>
Did you find the original article?				
Have you seen this headline before?	<b>Yes</b>	<b>No</b>	<b>No</b>	<b>Total</b>
Yes	5%	2%	43%	<b>50%</b>
No	3%	1%	46%	50%
<b>Total</b>	<b>8%</b>	<b>3%</b>	<b>88%</b>	<b>100%</b>
Not the original but other related texts?				
Have you seen this headline before?	<b>Yes</b>	<b>No</b>	<b>No</b>	<b>Total</b>
Yes	<b>5%</b>	3%	43%	<b>50%</b>
No	2%	1%	46%	50%
<b>Total</b>	<b>7%</b>	<b>4%</b>	<b>88%</b>	<b>100%</b>



Still in the example of headline 4, as shown in Table 9, half of the respondents said they knew about the information presented in the headline. A small percentage (12%) decided to do some extra research on the topic and, among them, 8% claimed to have found the original news. It is a very worrisome result because it reflects a functional illiteracy as they were not able to identify the differences between the text presented in the questionnaire and the one that was considered original.

#### 2.4.5 Headline 5: false information from 5 years ago

<b>Number of Brazilians moving abroad decreases</b>
Registries concerning definitive departure from Brazil have decreased 165% over a period of seven years; this movement's peak happened in the midst of recession, from 2015 to 2016.
The number of people who decide to leave Brazil in order to move abroad has decreased 165% over a period of seven years. In 2011, 8.1 thousand departure declarations were delivered to Brazil's Federal Revenue; in 2017, however, this number more than doubled, and 21.7 Brazilians left the country up until december 13th (more recent data). That is due mainly to the high value of the US dollar, which decreases Brazilians' purchasing power.

**Table 10**

*Headline 5: evaluation versus confidence*

	<b>CERTAINLY</b>	<b>I DO NOT KNOW</b>	<b>NOT SURE</b>	<b>Total</b>
FALSE	<b>16%</b>	5%	20%	41%
I DO NOT KNOW	3%	16%	2%	21%
TRUE	<b>33%</b>	3%	2%	37%
<b>Total</b>	<b>52%</b>	<b>24%</b>	<b>24%</b>	<b>100%</b>

Headline 5 presents dangerous false information. Even though it was false, 33% of the respondents stated with certainty that the information was true (Table 10).

**Table 11**

*Headline 5: more information*

Did you do any research?			
Have you seen this headline before?	<b>Yes</b>	<b>No</b>	<b>Total</b>
Yes	9%	35%	<b>44%</b>
No	5%	51%	56%
<b>Total</b>	<b>14%</b>	<b>86%</b>	<b>100%</b>
Did you find the original article?			

Have you seen this headline before?	Yes	No	No	Total
Yes	6%	3%	35%	<b>44%</b>
No	3%	2%	51%	56%
<b>Total</b>	<b>10%</b>	<b>4%</b>	<b>86%</b>	<b>100%</b>
Not the original but other related texts?				
Have you seen this headline before?	Yes	No	No	Total
Yes	<b>7%</b>	2%	35%	<b>44%</b>
No	3%	2%	51%	56%
<b>Total</b>	<b>9%</b>	<b>5%</b>	<b>86%</b>	<b>100%</b>

Less than half (44%) of the respondents said that they already had the information mentioned in the headline and 14% confirmed having done some research on the topic, with 10% of them claiming to have found the original article. This result offers further evidence of digital functional illiteracy among the sample.

In addition, Table 11 indicates that 7% knew the text of the story and claimed having found other texts related to it.

#### 2.4.6 Headline 6: true information from 5 years ago

Year of 2015 marked by racism and intolerance
Religious intolerance has caused hundreds of deaths around the globe. Criminals have used the internet to offend and make victims.
The year was marked by invisible barriers, which left deep scars. Many lives were affected by intolerance and by the difficulty at accepting what is different. A hate crime was broadcasted live, when a journalist and a cameraman were killed by a former colleague during an interview in the US. The shooter claimed to be the victim of racial discrimination.

**Table 12**

*Headline 6: evaluation versus confidence*

	CERTAINLY	I DO NOT KNOW	NOT SURE	Total
FALSE	<b>9%</b>	5%	19%	33%
I DO NOT KNOW	4%	14%	1%	20%
TRUE	<b>42%</b>	4%	2%	47%
<b>Total</b>	<b>55%</b>	<b>23%</b>	<b>22%</b>	<b>100%</b>

Finally, headline 6 was evaluated as true by 42% of respondents, as shown in Table 12.

**Table 13**  
*Headline 6: more information*

Did you do any research?			
Have you seen this headline before?	Yes	No	Total
Yes	11%	38%	<b>48%</b>
No	3%	49%	52%
<b>Total</b>	<b>13%</b>	<b>87%</b>	<b>100%</b>
Did you find the original article?			
Have you seen this headline before?	Yes	No	Total
Yes	9%	2%	38%
No	1%	2%	49%
<b>Total</b>	<b>10%</b>	<b>3%</b>	<b>87%</b>
Not the original but other related texts?			
Have you seen this headline before?	Yes	No	Total
Yes	<b>9%</b>	2%	38%
No	1%	1%	49%
<b>Total</b>	<b>10%</b>	<b>3%</b>	<b>87%</b>

In the example of headline 6, 48% asserted that they knew the content of the text and 13% indicated that they had performed some research on the topic. Among them, 10% claimed to have found the original text. In addition, Table 13 also reveals that 9% knew the subject and found texts related to it.

## 2.5 Analysis of the results of phase 1 (control group)

The analysis of the control group reveals that, among true news, on average 10% of the 60+ population definitely consider the information to be false regardless of the time it was broadcast.

Among the false information, a pattern was not detected based on the date of the event. Nevertheless, this population tends to believe in the truthfulness of information. What drives this conclusion is the fact that a higher number of respondents confirmed believing with certainty in false information than in true news (14% believed in headline 3; 24% in headline 4; and 33% in headline 5).

Headline 3 was the only one that presented an expressive percentage of respondents who did not believe in the veracity of the information provided.

As an average, 30% of respondents pointed that the information received was true, regardless of the time that it was broadcast and the veracity of the information. If

headline 3 was excluded from the average calculation, this percentage would rise to 35%.

Overall, digital literacy tools were very little used by the respondents to check out the information of the news. The detailed results presented in the tables reveal that Brazilians in the 60+ group emerge as a niche for the dissemination of fake news.

### 3. Social media literacy program

The social media literacy program was designed for regional adaptation to ensure its relevance and reportability for Brazilian audiences.

MediaWise has been partnering with a Brazil-based organization, identified as Comprova, who played a crucial role in the program, since it is a prestigious fact-checking organization. Comprova was responsible for the content of the course in Portuguese.

The selected ambassadors chosen to present the course were Boris Casoy and Lillian Witte Fibe, two famous and very respected TV journalists with a potential engagement with 60+ participants.

For a period of ten days, people who signed up for the course received daily a short piece of content on WhatsApp, such as a video or text. The course content was interactive, and it covered digital media literacy tips and tools, such as lateral reading, click restraint, algorithms, and reverse image search.

The 10-days course can be reviewed by the participants as many times as necessary, which favors the autonomy of the elderly student during learning. Another highlight of the methodology is the possibility to store the video lessons on the student's WhatsApp. The chosen interlocutors are also seen as charismatic by this audience, showing the mastery of teaching.

MediaWise's methodology is in line with other experiences applied to the same age group, as the research conducted by Flauzino *et al.* (2020)<sup>19</sup> on digital literacy with 317 elderly people enrolled in social programs for 60+ population in the University of Sao Paulo. According to the researchers, the efficiency of a program oriented to this strata depends on some criteria such as: a) a patient, calm and attentive mediator; b) a mastering knowledge about technologies and didactics in teaching; c) the capacity to identify and adapt the educational proposal to the sensory deficits of elderly students; d)

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<sup>19</sup> Flauzino, K. de L. *et al.* (2020). *Letramento Digital para Idosos: percepções sobre o ensino-aprendizagem*. Educação & Realidade. 45(4), p. 1-17. Retrieved from: <https://doi.org/10.1590/2175-6236104913>.

the presentation of activities with practical usability of technology in everyday life; and e) techniques to favor the autonomy of the elderly student during learning.

#### 4. Second phase (treatment group)

After two months of the completion of the course, the same interviewees from the control group were presented to other six news in a random order.

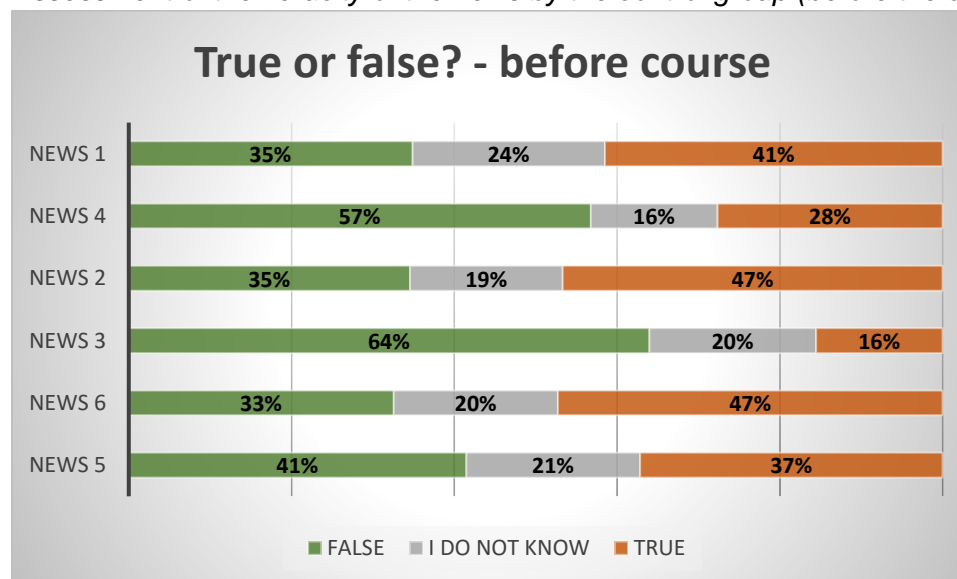
As in the first phase, the news took into account the time frame. Two were from 2022 (Headlines 1 and 2), two from 2020 (Headlines 3 and 4) and two were related to stories inserted in a context of five years ago (Headlines 5 and 6).

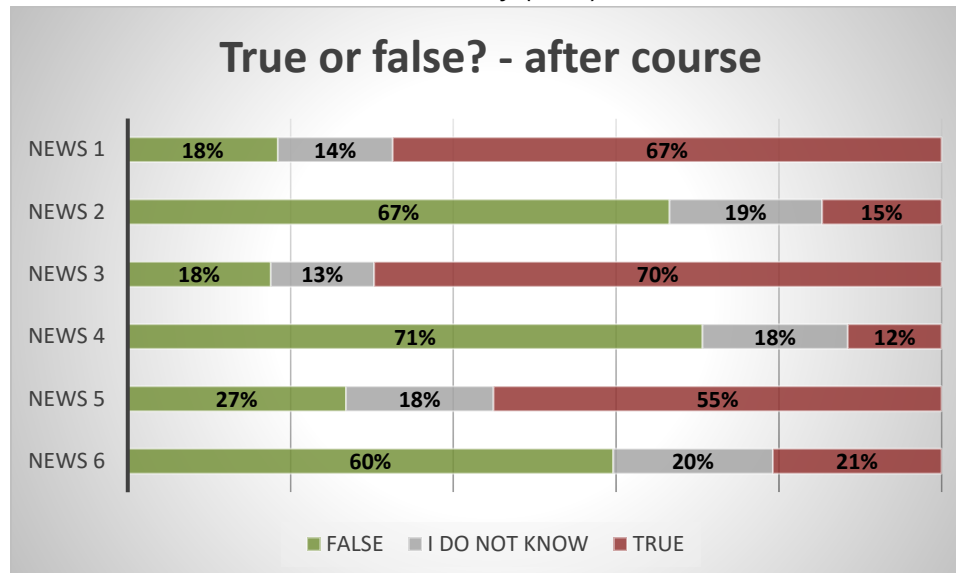
For each pair, one was true (Headlines 1, 3 and 6) and the other was false (Headlines 4, 5 and 6).

Pictures were shown in all the news with the objective of checking if any interviewee would use the Reverse Image Search technique.

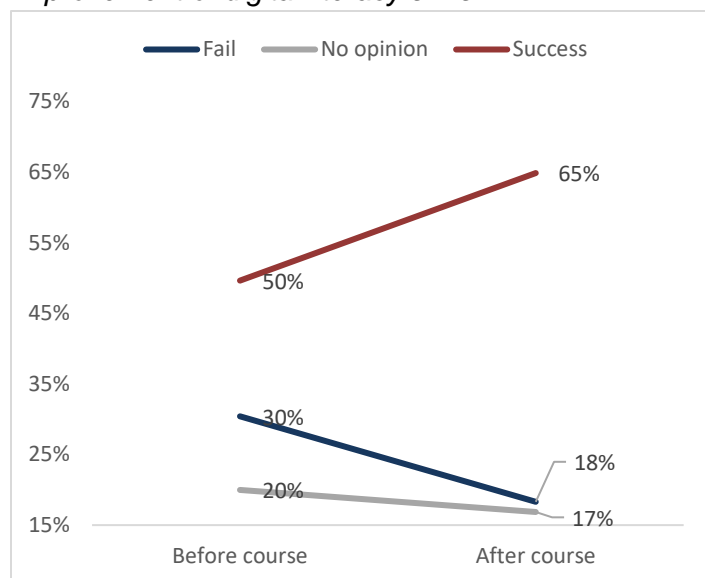
**Figure 13**

*Assessment of the veracity of the news by the control group (before the course)*



**Figure 14***Assessment of the information veracity (after)*

Figures 13 and 14 show the results of the interpretation of the six news before and after the course provided by MediaWise. Based on these percentages, the averages of correctness, indecision and evaluation error were obtained, which are presented below, in Figure 15.

**Figure 15***Improvement of digital literacy skills*

After the course, the participants showed a slightly lower ability to identify the veracity of stories in a context of 5 years ago when compared to the correct appraisal of news

from 2020 and 2022. Before the course, the time frame does not seem to be significant in this task.

Figure 15 shows how much the interviewees improved the accuracy index in assessing the veracity of news. On average, before the course, 50% [43.3% to 54.9%] of respondents answered correctly whether the news was true or false, while 20% [14.7% to 25.3%] did not know and 30% [25.1% to 35.7 %] presented wrong answers.

It is interesting to point out that the result obtained before the course shows the complete randomness of the answers in determining the nature of the information, once there were only two options to be chosen.

After completing the digital literacy course, on average 65% [59.5% to 70.2%] of respondents assessed correctly the nature of the information – if true or false; 17% did not know how to evaluate and 18% [13.0% to 23.6%] gave wrong answers.


Even including a margin of error of 5.32%, the results reveal a significant increase in the percentages of correct answers, which allows the conclusion that a higher number of elderly could identify correctly if the information presented in the stories was true or false after completing the MediaWise program. This conclusion is also reinforced by the lower rate of wrong answers when compared to the results obtained before the program.

Furthermore, including the limit of the margin of error, there is the potential that the assertiveness rate could reach up to 70.2% among those that participate of the MediaWise digital literacy program

The technical tie only appears in the percentage of those who did not know how to give an opinion about the veracity of the information.

In the next sections, we present the headlines that were part of the second phase of the research that was carried out after the completion of the course.

#### 4.1 Headline 1: true information from 2022



**Heiress decides to refuse billionaire fortunes: "I've done nothing to earn it"**

A literature student from Vihenna and descendant of the founders of Basf, a multinational chemical company with 78-billion-euro revenue, Austrian Marlene Engelhorn, age 30, has decided to refuse 90% of a 4.2-billion-euro inheritance (equivalent to R\$21.9 billions) for believing that income for which she did not work would not make her happy. The young woman, member of the Millionaires for Humanity organization, a group in favor of "taxing the super-rich in the same way as the working class", will receive the money when her grandmother, Traudi Engelhorn-Vechiatto, passes away.

**Table 14**

*Digital literacy tools used after course*

Is this a true or a false information?				
	FALSE	I DO NOT KNOW	TRUE	Total
Did you find the original article?				
Yes	3%	4%	<b>47%</b>	54%
No	16%	10%	20%	46%
<b>Total</b>	<b>18%</b>	<b>14%</b>	<b>67%</b>	<b>100%</b>
Did you use any searching tool?				
Yes	1%	3%	23%	26%
No	18%	12%	45%	74%
<b>Total</b>	<b>18%</b>	<b>14%</b>	<b>67%</b>	<b>100%</b>
Did you find other related texts?				
Yes	1%	1%	8%	9%
No	18%	14%	60%	91%
<b>Total</b>	<b>18%</b>	<b>14%</b>	<b>67%</b>	<b>100%</b>
Did you use reverse image search?				
Yes	0%	0%	7%	8%
No	18%	14%	60%	92%
<b>Total</b>	<b>18%</b>	<b>14%</b>	<b>67%</b>	<b>100%</b>

According to Table 14, 47% stated that the information was true and searched for the original article on the internet.



## 4.2 Headline 2: false information from 2022

### Bone marrow transplant



Research conducted by hematologists has shown that autologous bone marrow transplant (BMT) for the treatment of multiple myeloma isn't safe and shouldn't be offered by the Universal Health-care System. Usually, this procedure requires the freezing of cells before infusion and, for that reason, was canceled, seen as it has caused the death of many patients, besides the necessary refrigerators are being used for the storage of vaccines ever since the beginning of coronavirus vaccination.

**Table 15**

*Digital literacy tools used after course*

Is this a true or a false information?				
	FALSE	I DO NOT KNOW	TRUE	Total
Did you find the original article?				
Yes	9%	2%	5%	17%
No	<b>57%</b>	16%	9%	83%
<b>Total</b>	<b>67%</b>	<b>19%</b>	<b>15%</b>	<b>100%</b>
Did you use any searching tool?				
Yes	16%	2%	3%	21%
No	50%	17%	11%	79%
<b>Total</b>	<b>67%</b>	<b>19%</b>	<b>15%</b>	<b>100%</b>
Did you find other related texts?				
Yes	12%	2%	4%	18%
No	55%	16%	11%	82%
<b>Total</b>	<b>67%</b>	<b>19%</b>	<b>15%</b>	<b>100%</b>
Did you use reverse image search?				
Yes	6%	1%	3%	10%
No	61%	18%	12%	90%
<b>Total</b>	<b>67%</b>	<b>19%</b>	<b>15%</b>	<b>100%</b>

In headline 2, 57% of respondents did not find the original article (Table 15) and, therefore, stated that the news was false.

### 4.3 Headline 3: true information from 2020



#### May 2020 matches record of warmest month

After registering extraordinarily high temperatures all over the world, the month of May 2020 is in a tie with 2016 as the warmest month ever recorded, according to scientists from the National Environmental Information Centers of NOAA.

The heat isn't restricted to May alone. The three-month season (March through May) and the year's accrued (January through May) are in second place in a 141-year world record.


**Table 16**

*Digital literacy tools used after course*

Is this a true or a false information?				
	FALSE	I DO NOT KNOW	TRUE	Total
Did you find the original article?				
Yes	3%	4%	<b>42%</b>	49%
No	14%	9%	28%	51%
<b>Total</b>	<b>18%</b>	<b>13%</b>	<b>70%</b>	<b>100%</b>
Did you use any searching tool?				
Yes	1%	3%	31%	35%
No	16%	10%	39%	65%
<b>Total</b>	<b>18%</b>	<b>13%</b>	<b>70%</b>	<b>100%</b>
Did you find other related texts?				
Yes	2%	1%	14%	17%
No	16%	12%	56%	83%
<b>Total</b>	<b>18%</b>	<b>13%</b>	<b>70%</b>	<b>100%</b>
Did you use reverse image search?				
Yes	1%	1%	10%	12%
No	17%	12%	59%	88%
<b>Total</b>	<b>18%</b>	<b>13%</b>	<b>70%</b>	<b>100%</b>

Table 16 shows that 42% of respondents stated that the news was true and found the original article on the internet.

#### 4.4 Headline 4: false information from 2020



### United Kingdom plans on undoing BREXIT

British Prime-Minister Boris Johnson has stated that the BREXIT ratification wasn't effective and that he'll place a request that England is re-integrated to the European Union. This decision has taken into consideration the costs with health and education after BREXIT, which increased around 30%. Another issue revealed by Boris Johnson is the people's current dissatisfaction, not having the same privileges as before, concerning the free circulation with other European countries.


**Table 17**

*Digital literacy tools used after course*

Is this a true or a false information?				
	FALSE	I DO NOT KNOW	TRUE	Total
Did you find the original article?				
Yes	7%	2%	3%	13%
No	<b>63%</b>	16%	8%	87%
<b>Total</b>	<b>71%</b>	<b>18%</b>	<b>12%</b>	<b>100%</b>
Did you use any searching tool?				
Yes	16%	3%	1%	20%
No	54%	15%	10%	80%
<b>Total</b>	<b>71%</b>	<b>18%</b>	<b>12%</b>	<b>100%</b>
Did you find other related texts?				
Yes	7%	1%	3%	11%
No	64%	17%	9%	89%
<b>Total</b>	<b>71%</b>	<b>18%</b>	<b>12%</b>	<b>100%</b>
Did you use reverse image search?				
Yes	5%	1%	1%	8%
No	66%	16%	10%	92%
<b>Total</b>	<b>71%</b>	<b>18%</b>	<b>12%</b>	<b>100%</b>

Table 17 shows that 63% did not find the original article and, therefore, answered that the story was false.

#### 4.5 Headline 5: true information from 5 years ago



**Face transplant grants a second chance to American who shot himself**

American Andy Sandness has managed to regain his life after being subjected to a face transplant in the US. He had shot his own face during a depressive episode in 2006, at the age of 21. Sandness received a new face in June, last year. The donor was a young man who also shot himself and died. The procedure, done a little over 20 times all over the world, has lasted 56 hours.

**Table 18**

*Digital literacy tools used after course*

Is this a true or a false information?				
	FALSE	I DO NOT KNOW	TRUE	Total
Did you find the original article?				
Yes	3%	4%	<b>24%</b>	31%
No	24%	14%	31%	69%
<b>Total</b>	<b>27%</b>	<b>18%</b>	<b>55%</b>	<b>100%</b>
Did you use any searching tool?				
Yes	3%	5%	23%	31%
No	24%	13%	32%	69%
<b>Total</b>	<b>27%</b>	<b>18%</b>	<b>55%</b>	<b>100%</b>
Did you find other related texts?				
Yes	3%	1%	12%	16%
No	24%	17%	43%	84%
<b>Total</b>	<b>27%</b>	<b>18%</b>	<b>55%</b>	<b>100%</b>
Did you use reverse image search?				
Yes	2%	1%	8%	11%
No	24%	17%	47%	89%
<b>Total</b>	<b>27%</b>	<b>18%</b>	<b>55%</b>	<b>100%</b>

When the respondents were confronted with older information, we found a decrease of the percentage (to 24%) in the number of those who stated that the news was true and said to have found the original article (Table 18).

#### 4.6 Headline 6: false information from 5 years ago

**Millions of Myanmar residents have fled their homes in 2017 and many of them are in Brazil**



The year of 2017 has registered a strange record: never in History had so many people been driven from their homes. Violence, intolerance, hunger: millions have fled in search of a better life. In Myanmar, religious persecution made Muslims flee to Bangladesh; however, a part of them has opted to go to Europe and many came to Brazil, where a large colony has sheltered them.

**Table 19**

*Digital literacy tools used after course*

Is this a true or a false information?				
	FALSE	I DO NOT KNOW	TRUE	Total
Did you find the original article?				
Yes	6%	2%	8%	16%
No	<b>54%</b>	18%	13%	84%
<b>Total</b>	<b>60%</b>	<b>20%</b>	<b>21%</b>	<b>100%</b>
Did you use any searching tool?				
Yes	12%	2%	4%	18%
No	48%	18%	16%	82%
<b>Total</b>	<b>60%</b>	<b>20%</b>	<b>21%</b>	<b>100%</b>
Did you find other related texts?				
Yes	7%	1%	5%	13%
No	53%	18%	16%	87%
<b>Total</b>	<b>60%</b>	<b>20%</b>	<b>21%</b>	<b>100%</b>
Did you use reverse image search?				
Yes	3%	1%	3%	6%
No	57%	19%	18%	94%
<b>Total</b>	<b>60%</b>	<b>20%</b>	<b>21%</b>	<b>100%</b>

Finally, 54% of the interviewees stated that the information presented in headline 6 was false and that the original piece was not found (Table 19).

The analysis related to the treatment group allows us to state that finding the original piece of the information was the most influential resource to help the respondents to answer about the veracity of the news.

## 5. Modeling and comparisons

A multinomial logistic regression<sup>20</sup> was used to compare the two phases of the research. This is a technique similar to binary logistic regression. The difference between them is that the first one requires that the dependent variable has more than two response possibilities. In our case, the dependent variable is the assessment made by the interviewees after reading each news item.

Three evaluation possibilities were defined: when the respondent answers correctly about the nature of the information (success), when he/she is wrong (failure) and when he/she has no opinion about it. The “no\_opinion” category was used as a reference in the modeling.

Preliminarily, all the control and independent variables were inserted, such as: sex, age, race, schooling, income, religion, internet connection frequency and web browsing time. These variables were considered before the contact with the MediaWise program. All the analysis modeling was performed in the integrated development platform RStudio, that interprets and compiles several languages – mainly the R language. The models were trained, according to the methodology of neural networks.

**Table 20**

*Multinomial logistic model before the course*

	Fail	p-value	Odds Ratio	Success	p-value	Odds Ratio
(Intercept)	-0.19	0.384		0.42	0.039	
TypeTRUE	0.15	0.234	not sig.	-0.27	<b>0.022</b>	0.764
Sex_Female	0.28	<b>0.029</b>	1.325	0.06	0.624	not sig.
Race_pardo	0.28	0.201	not sig.	0.49	<b>0.016</b>	1.640
Race_white	0.48	<b>0.027</b>	1.613	0.75	<b>0.000</b>	2.111
Race_asian	12.13	0.924	not sig.	11.96	0.925	not sig.
Race_indigenous	1.58	0.156	not sig.	1.48	0.178	not sig.

Table 20 suggests that only the variables sex and race are predictors for the correct or incorrect assessment of the nature of the information (if true or false).

When it comes to comparing the group that failed to recognize whether the information was true or false to the group that had no opinion at all, the chance of the assessment being wrong among women increases 1.325 times (32.5%) when compared to men.

White elderly men are 61.3% more likely to err in identifying the nature of the information than black elderly people in comparison to those who have no opinion about the piece’s veracity.

<sup>20</sup> Hosmer, D.; & Lemeshow, S. (2013). *Applied Logistic Regression*. 3 ed. New York: Jonh Wiley & Sons.

The second part of the multinomial model compares the group that was successful in the assessment concerning the nature of the information, to those who had no opinion about it.

True information was 23.6% less likely ( $1 - 0.764 = 23.6\%$  less) to be identified as true when compared to false stories. The chance of mixed race (“pardos”) people correctly identifying the nature of the information increases by 1.640 (64%) when compared to black respondents, and the likelihood of white being successful in assessments is 2.111 times greater (111%) than blacks.

After the completion of the course, all the control and independent variables of the first part of the model were considered, as well as a variable that identifies the answer given before or after the program.

None of the control or independent variables proved to be significant for predicting the respondent's chance of succeeding in assessing the nature of the information.

Therefore, the final multinomial logistic model only considered the nature of the information (true or false) and the phase (before or after the completion of the course).

**Table 21**

*Multinomial logistic model after the course*

	Failure	p-value	Odds Ratio	Lower (95%)	Upper (95%)
(Intercept)	0.26	0.001			
TypeTRUE	0.32	0.001	1.372	1.136	1.657
WaveAFTER	-0.34	0.000	<b>0.711</b>	<b>0.587</b>	<b>0.860</b>
	Success	p-value	Odds Ratio	Lower (95%)	Upper (95%)
(Intercept)	0.93	0.000			
TypeTRUE	-0.04	0.618	0.959	0.815	1.129
WaveAFTER	0.44	0.000	<b>1.550</b>	<b>1.316</b>	<b>1.825</b>

The equations that compare the variables in Table 21 are:

$$\log \left( \frac{Fail}{No\ opinion} \right) = 0.26 + 0.32 * Type - 0.34 * Course \quad (1)$$

and

$$\log \left( \frac{Success}{No\ opinion} \right) = 0.93 - 0.04 * Type + 0.44 * Course \quad (2)$$

The results show that the chance of being successful in detecting the nature of the information versus having no opinion at all is 1.550 times greater (or 55% greater, or anywhere between 31.6% and 82.5% with 95% confidence) after completing the MediaWise course.

Furthermore, after the digital literacy program, the chance of failing to detect the nature of a piece of information was 0.711 times lower (or  $1 - 0.711 = 28.9\%$  lower, or any value between 14% and 41.3 % with 95% confidence) compared to having no opinion at all.

## 6. Final remarks

The survey showed that the group over 60 years old is still unaware of everyday internet terms such as phishing, spyware or pop ups. In Brazil, there is an additional element of difficulty once these terms do not have correspondents in Portuguese.

SEO tools that lead to distribution of advertising or news according to the user's interest are not the least known by the interviewees, but its functioning is far from being fully mastered.

Among the research findings, a highlight to be considered is that elderly people post and share information that is of their own interest or that corresponds to their point of view. And these kinds of news or opinions will probably be spread by SEO tools.

Other digital tools such as click restraint, reverse image searching, or lateral reading were indicated in the MediaWise program but were identified as the least known by this audience. Even after completing the course, reverse image searching was an underused digital literacy technique. However, lateral reading became the differential for determining the veracity of the news.

In addition, the research group recognizes that social media is the environment in which false information is spread. They also have a slight suspicion that major world events have some other version that ended up being covered up by traditional media.

In the end, it is possible to conclude that the digital literacy course has fulfilled its objective, as it was able to enhance the chance for the elderly to recognize the truth from the false nature of the news. Among the answers, the main tool that proved to be effective in helping the elderly was lateral reading, once they claimed to have looked for the original or related stories about the topics on analysis.