

## **The COVID - 19 pandemic's impact on the behavioral trends in the use of printed book or e-book: a case study in Portugal and Brazil**

**Luiza Baptista Melo<sup>1,2</sup>, Tatiana Sanches<sup>3,4</sup>  
Isabel Sá<sup>5</sup>, Célia Cruz<sup>5</sup>, Vânia Funaro<sup>6</sup>, José Mário de Oliveira  
Mendes<sup>7</sup>**

<sup>1</sup>Faculdade de Medicina Dentária, Universidade de Lisboa, Portugal

<sup>2</sup>Universidade de Évora - Centro Interdisciplinar de História, Culturas e Sociedades, Portugal

<sup>3</sup>UIDEF, Instituto de Educação, Universidade de Lisboa, Portugal

<sup>4</sup>APPsy, ISPA – Instituto Universitário, Lisboa, Portugal

<sup>5</sup>Faculdade de Ciências, Universidade do Porto, Portugal

<sup>6</sup>Faculdade Odontologia da Universidade de São Paulo (FOUSP), Brazil

<sup>7</sup> Fundação Escola de Sociologia e Política de São Paulo (FESPSP), Brazil

**Abstract:** In a time of serious health crisis worldwide, this study is the extension of a case study already started (in February and March 2020) about the issue, reading behaviors, and preferences between the use of books and e-books. The COVID-19 pandemic came to impose social distancing in the world, closing universities, schools, and other services. The implementation of Internet services has presented itself as a valid response to the change that has so brutally arisen. Naturally, everyone had to adapt to it. In this context, the question about the preferences in using books or e-books is now even more relevant. This paper analyses the impact of COVID-19 in the behavioral trends in the use of scientific information from printed books and e-books in Portugal and Brazil. To this end, a survey was conducted on a user sample from various Portuguese and Brazilian higher education schools and public libraries. The first part focused on the characterization of the respondents, which includes data on gender and qualifications attended. In the second part, we obtained viewpoints about the advantages and disadvantages of each medium, frequency of use,



choice of medium according to the purpose of reading, and devices used. The results let us examine the factors that influence and change the behaviors of users concerning their choice. Research such as this is beneficial to support the decision not only in selecting the information resources to be bought or pondering user preferences, but also to define strategies for advocating the use of various media that, rather than competitors, should be complimentary.

**Keywords:** Book, E-book, Behavioural trends of reading, COVID-19, Portugal, Brazil

## **1. Introduction**

On December 2019, a new coronavirus (SARS-CoV-2) started to circulate, which was identified in Wuhan (China) and caused COVID-19 (Portugal. Ministério da Saúde. Direção Geral da Saúde, 2020). The infectious disease caused by the most recently discovered coronavirus has a clinical spectrum ranging from asymptomatic infections to serious illnesses. According to the World Health Organisation, the majority (about 81%) of the patients with COVID-19 can be asymptomatic or oligosymptomatic (few symptoms), and around 14% of the cases detected require hospital care because the infected individuals show breathing difficulties, of which approximately 5% may need mechanical breathing support (WHO-World Health Organization, 2020<sup>a</sup>). This disease has proliferated throughout the world, causing a hazardous pandemic.

Since March 2020, the Portuguese government has been declaring successive States of Emergency and promulgating prohibitions on exits to public roads, lockdowns in commerce, companies, schools, universities, tourism, and restrictions in the movement of people among regions and countries. A large part of human activities has been prohibited to prevent the spread of this disease. In this situation, remote working, e-commerce, and the development of most activities over the Internet have benefited from it.

Reports on the pandemic situation in Brazil showed that the first confirmed case took place in São Paulo, on February 26<sup>th</sup>, 2020, and the spread of the coronavirus accelerated rapidly through air routes and main urban centers, strengthening, and causing the closure of activities considered non-essential (Brasil. Ministério da Saúde, 2020).

The public services and university libraries were no exception. Professionals working in these services have tried to find and develop new solutions to facilitate access to information and support users in these difficult times of fear, illness, and death. Some studies were published taking into account the emerging trends aroused by this pandemic (Asif, & Singh, 2020; Baker & Ellis, 2021; Koscieljew, 2020; Tunga, 2021), namely in terms of the adjusted supply of spaces and services (Chan & Caplan, 2021; Walsh & Rana, 2020). Questions were also raised regarding emergency remote teaching and the articulation of libraries in this new learning context (Glimstedt, Kjellin, Michnik, 2021; Zhou, 2021). In addition to these issues, there are concerns regarding the digital divide and social asymmetries that are heightened by different access to information

(Ameen, 2021; Shackleton & Mann, 2021; Zain, 2021). Psychological issues have also been addressed as a responsibility (Alajmi & Albudaiwi, 2021) and collaboration of libraries in teaching information literacy to combat misinformation (Bangani, 2021; Phippen & Bond, 2021), as well as new issues relating to post-pandemic opportunities (Atkinson, 2021; Hamilton, 2021; Kirkham, 2021; Lowe, Chirombo, Coogan, Dodd, Hutchinson, Nagata, 2021). The establishment of projects with Portuguese-speaking countries is always important because there are naturally many common cultural roots. Thus, the desire to bring these peoples closer together arises and motivates the establishment of partnerships between Portugal and Brazil and the carrying out of this study.

In February and March 2020, we carried out a study on behavioral trends in reading the printed book, the e-book, and its content. It was a case study in Portuguese university libraries (Lisbon and Porto) and public libraries in São Paulo, Brazil. We considered it relevant to investigate the impact of COVID-19 on behavioral trends in reading printed books or e-books. The main objective of this work was to observe the results obtained from a survey to verify the impact of the COVID-19 pandemic on the reading behavior of books and e-books. A literature review is given, then we refer to the methodology used in this research, the data obtained, and finally, we present the results discussed and the main conclusions.

## **2. Literature review**

During the COVID-19 pandemic some researchers from India, North America, Germany, and France (Parikh, Vyas and Parik, 2020; Kumar and Dwivedi, 2020; Cummings, 2020; Marioni, G., van't Land, H. and Jensen, T, 2020), conducted studies, particularly based on questionnaires. These were mainly about: distance teaching and learning; and people's reading behaviors for learning and leisure.

People facing this serious global public health situation have had to change many of their habits. Parikh, Vyas, and Parik (2020) refer that "looking for the need of the hour to provide e-library services to members from home, the first step is to learn their follow-up habits during the shutdown". Portugal and Brazil were no exception. The libraries observed the behaviors of their users. Then, they adapted as quickly as possible a greater number of services using the Internet.

The WHO Director-General, Dr. Tedros Adhanom Ghebreyesus, stated that in these pandemic times "we understand the fear and anxieties many feel and know how the joy of reading can stimulate young minds, ease tensions and provide hope" (IPA, WHO and UNICEF, 2020). Cummings (2020) mentioned, "Books as a refuge: what Yale professors are reading during the pandemic" with some little texts by the professors themselves.

Many libraries' users have been isolated at home away from libraries and books because of the lockdown. However, many libraries provide users with remote access to e-books or digital resources from home. We recognized that in

Portuguese and Brazilian universities, some well-known international publishers, such as ACM, IEEE, Springer, Oxford Press, and many others have made their selected digital resources (journals/books/conference papers) available in open access during COVID-19. A study in three academic libraries in Portugal (Antunes, Lopes, Sanches, 2021) concluded that the perception of higher education students about the response of their libraries in times of COVID-19 pandemic is satisfactory, recognizing the positive support received. However, there are still challenges. It is now necessary to pay more attention to digital resources and train for their full access and use, to benefit students and contribute to their academic success.

A survey on the impact of the lockdown imposed by the coronavirus on the Indian population and their reading habits found that before the lockdown 15% of the respondents had reading habits and since the lockdown, 36% of the respondents had reading habits (Kumar and Dwivedi, 2020). Since they were spending more time at home, more people had chosen to read "whether to make sense of these trying times or to briefly escape them through a bit of thought-provoking prose" Cummings (2020).

Zawacki-Richter (2020) referred to a study, carried out in Germany, about digital media, tools, and services for learning in higher education. He concluded that "it becomes clear that with the further proliferation of mobile devices, the intensity of the use for almost all activities has also increased from 2012 to 2018." He also deduced that this equipment has been used for library services, Internet search, and retrieval of grades. Furthermore, he presumed "the acceptance of printed texts also falls from fifth to 10th place in 2018, while electronic texts (e-books, PDFs) are constantly in seventh (2012) and eighth place (2015 and 2018). Online library services drop from 11th (2012 and 2015) to 15th place in 2018." The libraries must pay attention to these data and like never before these services must adopt very fast digital resources.

The International Association of Universities in Paris has published a report on the impact of COVID-19 on the research, teaching, and management of universities worldwide (Marinoni, van't Land, & Jensen, 2020). This study was based on a global survey analysis based on 424 replies from 109 countries from Africa, the Americas, Asia, the Pacific, and Europe. It also covered two Special Administrative Regions of China (Hong Kong and Macao). These authors concluded that a lot of respondents think that the experience of working and teaching from distance is an excellent chance "to learn from this exceptional situation and to propose more flexible learning possibilities, explore blended or hybrid learning and mix synchronous learning with asynchronous learning". On the other hand, the institutions may decide to invest more in technical infrastructures to allow this transformation "from management learning systems to cloud services, to the digitalization of administrative processes and access of documents, resources and libraries".

The COVID-19 pandemic situation is a great challenge to move as fast as possible to a more digital world. In this context, it is important to understand how this challenge is accepted and persisted in the reading habits of library users in Brazil and Portugal.

These are the main issues raised in this article: what is the preference of Brazilians and Portuguese for reading books or e-books? How did the Brazilian and Portuguese populations react to the severe restrictions of being locked up in their homes? What reading behaviors (in the study, learning, news, and leisure) did they present during this period?

### **3. Methods**

This study aims at analyzing the impact of the COVID-19 pandemic on the behavioral trends regarding access to reading with a focus on the type of support (paper and digital). It was developed in a partnership with institutions from Portugal and Brazil. These institutions were: the Faculty of Dentistry, University of Lisbon (Portugal), the Institute of Education, University of Lisbon (Portugal), Lisbon (Portugal), the Faculty of Sciences, University of Porto (Portugal), the Faculty of Dentistry, University of São Paulo (FOUSP) (Brazil) and the Foundation School of Sociology and Politics of São Paulo (FESPSP) (Brazil). Data were obtained through an online multiple-choice questionnaire. The analysis was performed using mixed methods (Creswell and Plano Clark, 2011), quantitative analysis (absolute and relative frequency calculations), and quantitative analysis (interpretation of the answers obtained in an open question). These methods represent a good approximation for obtaining conclusions under conditions similar to the limitations experienced by the circumstances due to COVID-19. The data collection instrument was a questionnaire with nine (9) closed questions and an open question. The questionnaire was developed using the Google Forms tool and was distributed in the authors' social networks, in the pages of the libraries in which the authors work, and sent by mail lists in the university institutions, for two months (January and February in Brazil, February and March 2021 in Portugal). Questions 1 to 5 are to identify the respondents: the country where they reside, gender, age, what type of library they attend or do not attend, type of user (student, teacher, researcher, etc.). Questions 6 to 8 refer to the type of support of the book they prefer to use (printed or e-book), and question 9 is to know whether there has been a change in the reading habits during the COVID-19 pandemic. Question 10 is open if anyone wanted to comment. Table 1. shows the indicators used.

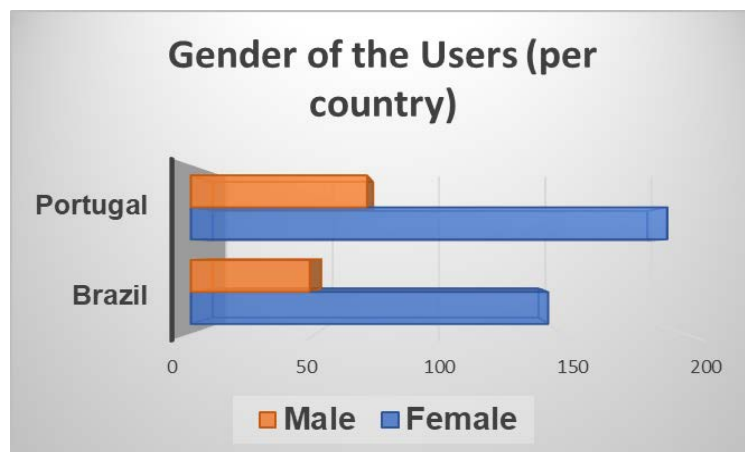
**Table 1. Identification of the respondents and preferences of reading habits**

Indicator	Description
1	Country of origin
2	Gender
3	Age
4	Library types
5	Kind of user (Professor/Student/Researcher etc.)
6	Characterization of printed books/e-books
7	Devices used for e-book reading
8	Reading preference in digital/printed format
9	Reading habits changed during the COVID-19 pandemic
10	Open question

## 4. Results

### 4.1 Quantitative Data

Figure 1 shows the sample distribution by gender and country. The sample consists of 456 valid responses from the survey, 194 (43%) from Brazil and 262 (57%) from Portugal. In both countries, the female respondents are more than male respondents.



**Figure 1. Frequency of respondents by gender and countries**

Figures 2 and 3 show the age distribution of respondents in Brazil and Portugal. It is evident that in Brazil the range of respondents is broader and more uniform between 21 years old and 64 years old. In Portugal, the group with the most responses is between 18 years old and 24 years old. This age is usually correspondent to university students.

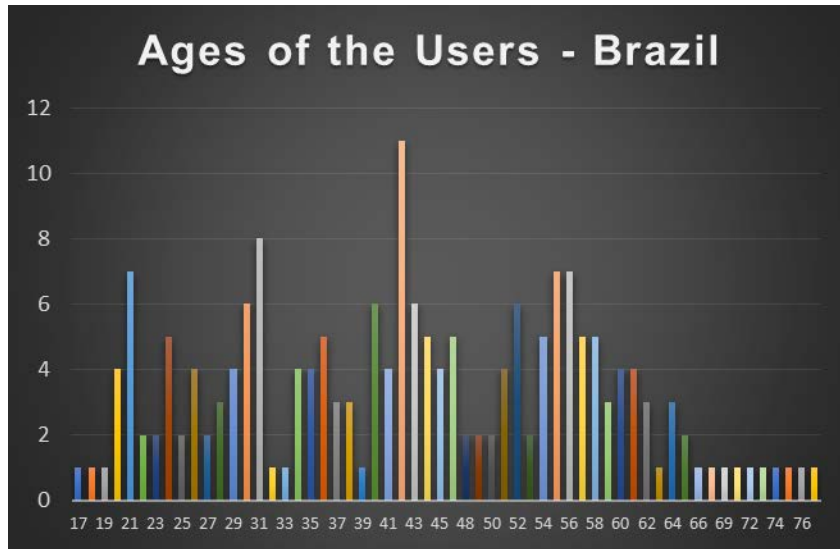


Figure 2. Frequency of respondents by age in Brazil

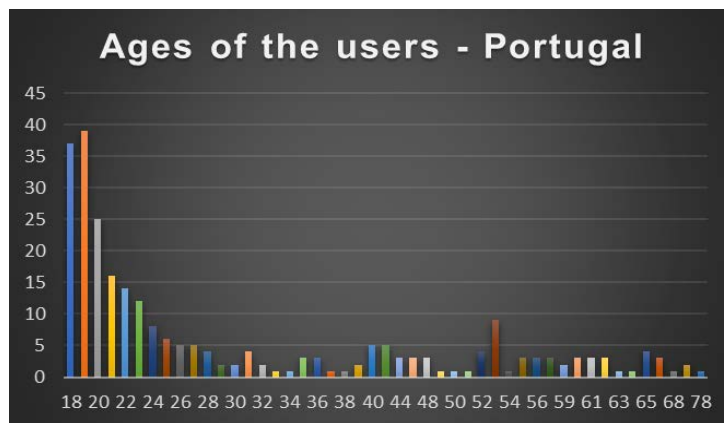
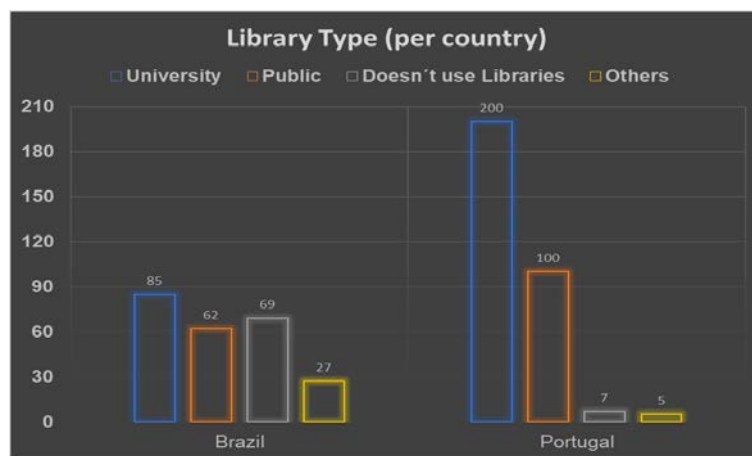


Figure 3. Frequency of respondents by age in Brazil

Figure 4 shows the absolute frequency of respondents by the library types attended in Portugal and Brazil. The data obtained in Portugal were from 200 responses from university libraries, 100 responses from public libraries, and 5 responses from other libraries. As we already noted there were more responses from students in Portugal. On the other hand, there are other types of respondents from the public and other libraries from Brazil users. The data obtained in Brazil were as follows: 85 responses from academic libraries; 62 responses from public libraries; 27 responses from other libraries and 62 responses stating that they do not use libraries. It was a good sample to study the various reading habits (books and e-books).



**Figure 4. Frequency of use of libraries by type and countries**

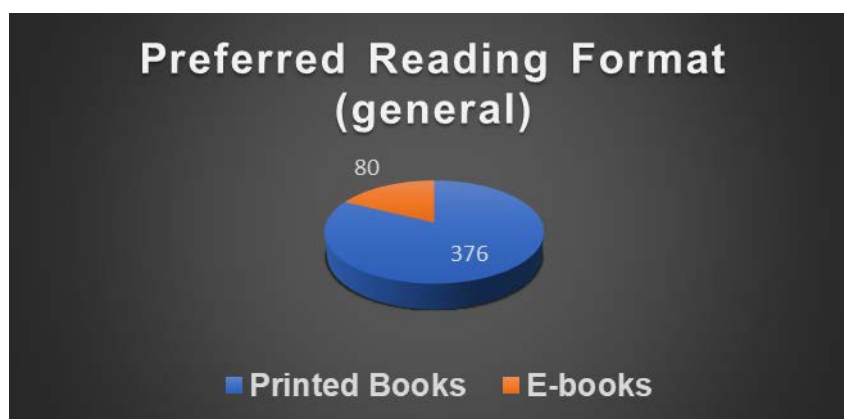
Table 2 presents the absolute and relative frequency by education degree and countries. These data underline the previous considerations about the composition of the sample. There were 73 responses (37.6% Brazil sample) and 3 responses (1.1% Portugal sample) with other degrees of education. These data made the sample more representative of society.



**Table 2. Absolute and relative frequencies by education degree and countries**

Degree	Brazil	%	Portugal	%
Undergraduate Student	32	16.49	142	53.79
Master's Degree Student	28	14.43	46	17.42
Ph.D. Student	9	4.64	12	4.55
Researcher	19	9.79	16	6.06
Professor	27	13.92	44	16.67
Librarian	6	3.09	1	0.38
Others	73	37.63	3	1.14
Totals	194	100.00	264	100.00

According to the survey carried out, 376 respondents prefer to read paper-based books while 80 respondents stated that they enjoy reading e-books, see Figure 5. These data reveal that, contrary to what could be judged with the advent of digital technology, the preference for reading is still the printed book. Next, we will see data related to the characterization of the type of reading in the paper and digital formats.

**Figure 5. Preferred reading: books or e-books**

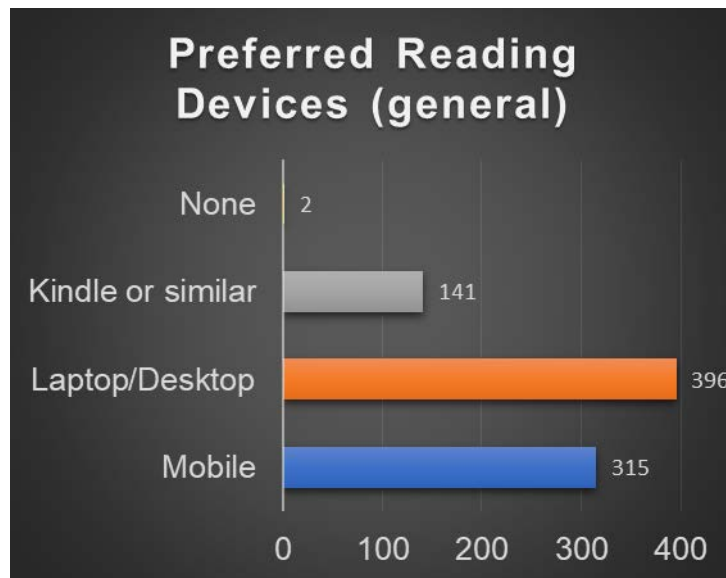
The data from characteristics of books and e-books (cheaper, easier to use, easier to transport, causes more eye strain, and causes lack of concentration) are in Table 3. Each respondent could answer more than one option.

**Table 3. Characteristics of the printed versus e-books (general)**

Characteristic	Printed Book	E-book
Cheaper	70	386
Easier to use	336	120
Easier to transport	102	354
Cause more eye strain	41	415
Cause lack of concentration	48	408

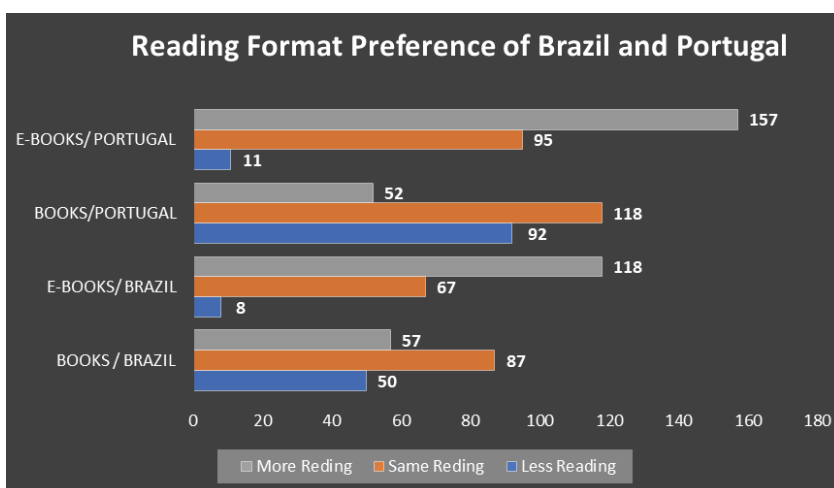
We underline the following data in Table 3.. 336 respondents referred that books are “easier to use”, only 41 respondents said that they “cause more eye strain” and 48 respondents affirmed that books “cause lack of concentration”. It is concluded that printed books reveal better reading conditions, do not cause as much visual fatigue, and provide better concentration.

Regarding e-books the data revealed the following: 386 respondents stated that e-books are cheaper than printed books and 354 respondents stated that e-books are easier to carry. Overall the advantages of e-books were their cost and portability.



**Figure 6. Devices used to access electronic documentation.**

Figure 6. shows the preference in browsing devices to read the texts made available for studying and leisure in digital format. The laptop/desktop is the most used device (46.4%) followed by the mobile (36.9%) and the Kindle or similar (17%).



**Figure 7. Reading formats preference changing due to the COVID-19 pandemic**

The data revealed changing reading formats due to the pandemic of COVID-19 in both countries, as shown in Figure 7. This case study showed the following evidence in reading habits concerning printed material and digital material: Portuguese and Brazilian readers preferred the digital format (157 and 118 responses). The trend presented by the data showed an increase in reading in digital material.

**Table 4. Content preference of reading during pandemic COVID-19 per country**

Content preference of reading per country	Less Reading	Same Reading	More Reading
For leisure reading/Brazil	36	81	76
To inform about news/Brasil	11	57	126
To study/Brazil	29	87	75
For leisure reading/Portugal	45	140	78
To inform about news/Portugal	10	117	135
To study/Portugal	6	134	125

However, for leisure reading in Brazil and Portugal (81 and 140 responses), they maintained their reading habits. For news reporting, there is a greater tendency to read (126 and 135 responses). The trends in reading habits for study remained the same in both countries (87 and 134 responses).

Figure 8 shows a graphic with data on how reading habits have changed due to the COVID-19 pandemic.

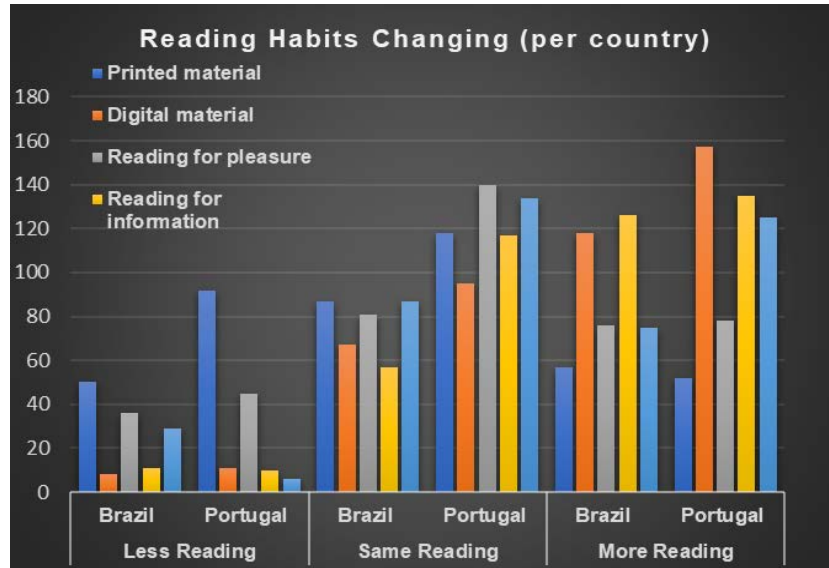


Figure 8. Reading habits changing due to the COVID-19 pandemic

#### 4.2 Qualitative Data

The qualitative data obtained refer to the open question of the survey and express the opinion of many respondents who want to clarify their quantitative responses. Therefore, they are compatible with the latter, reinforcing the results presented above. The qualitative analysis refers to the data obtained from the 32 comments left by the interviewees in the space intended for this purpose. The opinions expressed in this question reveal information about the advantages and disadvantages of the digital and printed formats, preferences for a specific typology of reading, and trends and adaptations in the face of the circumstances imposed by the experience of the ongoing pandemic in the libraries.

The preference for the digital format is pointed out for several reasons. They are the advantages of visualization for people with vision problems; for being more convenient, practical, and easier to access and allowing updates of content; research, and access to information quickly and easily.

The reader's digital reading habits are mainly associated with the use of technical documentation and the need to access updated information, which was especially relevant in the context of the COVID-19 pandemic.

Some of the advantages of using mobile reading devices, as pointed out in the comments section, are the editing features and ease of handling. On the other hand, digital reading devices can make reading difficult and tiring. Even the software and platforms of the devices are not friendly.

Reading in printed format is the most preferred reading format for leisure and fun. It is an easy and portable way of reading, stimulating the imagination and the pleasurable feeling of the paper sheets. Moreover, the formats are less tiring and likely to promote greater concentration. However, the disadvantage of the printed format is that the content tends to be quickly out of date.

It is also mentioned, in the comments section, that with the closing of libraries and restrictions of entrance in library buildings due to the COVID-19 pandemic, it became more difficult for library users to access primary sources of information as well open-access digital contents by specific publishers.

As expected, during the prolonged lockdown periods, there was a greater demand for the digital format. However, the proliferation of online communication platforms in the distance learning environment made students feel overloaded when following up with their online courses. Facing this new reality caused by COVID-19, libraries tried to encourage remote and online services to respond to their users' needs and continue supporting teaching, learning, and research in a digital environment.

## **5. Discussion**

The sample of this study, with 456 respondents is mostly female (336). In Brazil, the ages of respondents range between 21 years old and 62 years old. In Portugal, the age of respondents is mostly under 30 years. The majority of respondents are undergraduate and graduate students. A small number of respondents come from both public library and university library users.

Nowadays, society recognizes the importance of digital resources as privileged instruments to access information. The data from this study revealed that although digital support is widely used, paper-based reading habits continue to deserve a prominent place. But how did the COVID-19 pandemic impact the reading choices of the users?

Reading habits seem to have changed due to the COVID-19 pandemic. It appears that both Portuguese and Brazilians are mostly reading on digital devices. The main findings confirmed both quantitative and qualitative data and, are consistent with a previous study (Melo, Sanches, Sá, Cruz & Novo, 2021), although now digital support is more accepted.

Respondents considered that digital documents proved to be cheaper, to have more accessibility, more portability, speed, and convenience; on the other hand, they have a greater propensity for dispersion and eye strain.

The respondents also considered that printed books were characterized by being a good-handling experience, easy to read, relaxing, and providing greater concentration, even though books are more expensive.

## **6. Conclusions**

The COVID-19 pandemic has brought some changes to the social level and cultural consumption habits. In this work, we tried to find out if reading habits would have been affected in Brazil and Portugal. With the emergence of the COVID-19 pandemic and with the closure of libraries and other spaces worldwide, due to the crisis created, it seems useful to collect data and to research the changes in reading behaviors.

This study was carried out using mixed methods (quantitative and qualitative). The sample for this study was obtained in Portugal and Brazil. It is a good representation of not only the academic population but also of society as a whole. Data were gathered from universities and public libraries. The respondents represent a wide age range, that is, from 17 to 78 years old and from different educational qualifications.

The data point to an increase in reading habits concurred with several studies mentioned in the literature review. With the lockdown and the obligation to be at home, people's habits have changed. Some of them chose to read more, regardless of the support, and this is transversal regarding reading purposes (studying, leisure, or reading news).

Digital format provides information with quick access, with immediate consultation and updates. Although interesting advantages are observed in the use of e-books and other digital materials, this study is consistent with previous investigations, which indicate that there is still a preference for the printed book over the digital one, particularly in leisure reading.

On the other hand, we observed that respondents consider the printed book to be easier to handle. However, despite e-books being easier to transport, they tend to cause more eye strain and lack of concentration.

We recognize that in the future it will be useful to investigate whether the choice of the reading medium varies with the content. We suggest obtaining data for answers to the following questions: is the digital format used primarily for news reading? Is leisure reading associated with the print format? Are the research and teaching more associated with both formats?

Studies on reading habits and behaviors are important to support decisions in the acquisition of books and e-books in libraries (academic, public and others), as well as to monitor the needs and expectations of users.

## **7. Appendix**

Questionnaire (originally in Portuguese language but translated by the authors for the benefit of non-Portuguese readers)

Preferences in the usage of digital/printed information

This study aims at analyzing behavioral trends in the use of scientific information with a focus on the type of medium. It is observed how the users of university libraries choose to use printed/digital information, with emphasis on the binomial traditional book. vs. e-book. The study is confidential and guarantees the anonymity of the participants.

\* Required

Characterization of participants

1 - Country of origin

Portugal

Brazil

2 - Gender \*

Male

Female

Rather not answer / Other

3 - Age \*

4 - Library typology attended

Public

University

Doesn't attend libraries

Others

5 - Type of user \*

Undergraduate student

Master's Degree student

Ph.D. student

Professor

Researcher

Librarian

Others

6 - How do you characterize the printed book/e-book? Choose only one answer for each line \*

Cheaper  
Easier to use  
Easier to transport  
Causes more eye strain  
Causes lack of concentration

7 - What devices do you use when using electronic documentation? \*

Mobile Phone  
Personal computer (desktop/laptop)  
Kindle  
Sony Reader or similar  
iPad, Nook, or similar

8 - In what format do you prefer the bibliography to be made available? (Choose only one option) \*

Printed (books or articles available in the library/photocopies)  
Electronic (e-books, links to chapters, or electronic magazine articles)

9 - How much have your reading habits changed due to the COVID-19 pandemic?

Printed material: less reading /same reading / more reading  
Digital material: less reading /same reading / more reading  
Reading for leisure: less reading /same reading / more reading  
Reading for information: less reading /same reading / more reading  
Reading for studying: less reading /same reading / more reading

Indique em que medida mudou os seus hábitos de leitura devido à pandemia COVID-19: [Frequência com que leio por lazer (ficção, romance, outros)]Indique em que medida mudou os seus hábitos de leitura devido à pandemia COVID-19: [Freq

IndiquEm 10 - To what extent have your reading habits changed due to the COVID-19 pandemic:  
- Frequency with which I read for leisure (fiction, novel, other) - less reading /same reading / more - - Frequency with which I read to inform myself (news, information)]

- Frequency of reading for study (academic or school material) → less reading /same reading / more reading

Indique em que medida mudou os seus hábitos de leitura devido à pandemia COVID-19: [Frequência com que leio para me informar (notícias, informação)]

11 - If you wish to make further comments, please use the space below.

Your answer:

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