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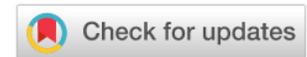
# INFANT HOSPITAL LIBRARY: Case Study in a Brazilian Public Hospital

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## Abstract

The child, when hospitalized, loses the freedom to play, as he is accustomed to, for being confined in a hospital environment, subject to a medical treatment that can cause pain and fear. The adult who accompanies needs information about the disease and the treatment of the child. The infant hospital library attempts to meet the needs of both of its users. However, such a library has not been thoroughly considered for scientific inquiry. Hence, this paper investigates its structure and actions by addressing three subjects as follows. First, a software was developed specifically for this type of library, which registered the catalog, users and loans data of two years of service of a voluntary infant hospital library in a Brazilian state public hospital. Then, an exploratory study of the reading preferences of the users while hospitalized was carried out, whose findings follow. Adults play an important role in encouraging and assisting recreational reading, which occurred in all age groups of a child and similarly between genders. Furthermore, users preferred to read literature, religious and comic books in their native language that generally consist of short stories. Finally, collection development policies were determined based on the users' reading preferences.

**Keywords:** Infant hospital library; Specialized software; Reading preferences; Collection development policies

## Resumo

A criança, quando hospitalizada, perde a liberdade de se divertir, como está acostumada, por estar confinada em um ambiente hospitalar, sujeita a um tratamento médico que pode causar dor e medo. O adulto que acompanha precisa de informação sobre a doença e o tratamento da criança. A biblioteca hospitalar infantil tenta atender às necessidades de ambos os usuários. No entanto, essa biblioteca não totalmente considerada para investigação científica. Assim, este artigo investiga a estrutura e ações abordando três pontos como seguem. Primeiro, o software foi desenvolvido especificamente para esse tipo de biblioteca, o qual registrou os dados do catálogo, usuários e empréstimos de dois anos de serviço da biblioteca hospitalar infantil voluntária em um hospital público estadual brasileiro. Em seguida, um estudo exploratório das preferências de leitura dos usuários enquanto hospitalizados foi realizado, cujos achados seguem. Adultos exercem um

importante papel em incentivar e auxiliar a leitura recreativa, na qual ocorrerem todas as faixas etárias de uma criança e similarmente entre gêneros. Além disso, os usuários preferiram ler literatura, religião e revistas em quadrinhos na língua nativa deles que geralmente consistem em histórias curtas. Finalmente, políticas de desenvolvimento de coleção foram determinadas com base nas preferências de leitura dos usuários.

**Palavras-chave:** Biblioteca hospitalar infantil; Software especializado; Preferência de leitura; Política de desenvolvimento de coleção

## 1 Introduction

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Investigations concerning a type of library always begin with the nature of its users and the situation in which they find themselves. The infant hospital library serves children between 0 and 12 years - which includes newborns, babies and exceptionally adolescents between 13 and 17 years, all of which are referred to in this paper as children for the sake of simplicity - who have a serious enough illness to have to remain interned in a hospital under the care of health professionals. However, a child should not remain in a hospital without the presence of a guardian. An adult has to accompany him throughout his hospitalization. In the absence of a guardian, the nurse has to assume this role. Thus, users of the infant hospital library are always grouped in pairs - the hospitalized child and the accompanying adult - which is different from the typical individuality present in most libraries, including the hospital library for adult patients.

The peculiarities of the nature and the situation of the users imply some specific needs. The restrictions imposed by the illness of the child recovering in a hospital diminish the freedom to play and have fun, as he is usually accustomed doing at home and school with his family and friends. Furthermore, pain and fear can traumatize the child who, often, does not understand why he is hospitalized and end up creating a poor image of the experience in the hospital. Ultimately, the effects of hospitalization can affect the health and development of the child. Thus, performing a leisure activity, such as reading a book, can mitigate these problems and even cause the child to collaborate with the treatment. For example, when reading the stories of a comic book, the child flees the harsh reality of the hospital for a moment and entertains himself with the imaginary world provided by the comics. This temporary mental relief may be sufficient for him to adapt to the new situation and environment, becoming more susceptible to accept the prescribed treatment by taking the medications, eating meals, allowing nurses to perform bandages and remaining at rest as much

as possible. By doing this, complications are avoided during treatment, which reduces the residence time in the hospital and frees up hospital resources for another child.

Nevertheless, the role of the accompanying adult is critical to maintaining the emotional stability of the child. In general, the adult represents the only family aspect of the child and the one who knows him best, be the tastes, the needs, or the fears. However, even for an adult who accompanies the child, the experience in the hospital can also be traumatizing. For example, witnessing his child's constant suffering is a situation that goes beyond the emotional capacity of many parents. And worse: he may feel partially responsible for this because of difficult decisions made with the doctor regarding the treatment. Besides that, the prolonged confinement in a hospital can also affect him. If this happens, the adult loses his role of maintaining the emotional stability of the child and, depending on the intensity, his physical health may feel reflexes. Hence, the accompanying adult also needs leisure activities to maintain his and the child's sanities.

Therefore, considering the child as the main user of an infant hospital library followed by the adult, the main necessity becomes *entertainment*, shifting to second the need for *information*, which is usually first in most libraries, including hospital libraries for adult patients (Holst 1991 qtd. in McMillen and Pehrsson 2004 p. 75). Nevertheless, knowledge remains a basic human need and is especially important in this situation. In fact, considering now only the accompanying adult, the need for information becomes greater or, at least, as important as that of entertainment. For example, for many adults, knowing the doctor's diagnosis caused relief, marking the turning point from uncertainty (Fisher 2001 p. 601). In addition, they still need complementary information about the child's illness, post-hospital treatment and care to avoid recurrence. This information can also help them make decisions about the child's treatment with the physicians more securely.

Another information-related problem, but particular to school, occurs when the child is hospitalized for a long period, possibly extending for several weeks or months. He can be severely impaired in school activities, including the possibility of losing the school year. Thus, the child needs pedagogical support while hospitalized.

To address these specific needs, the infant hospital library has to perform some functions which are different from those exerted by other types of libraries. The recreational and leisure activities of users, related to the need for entertainment, can be performed by reading books or

comics, for instance. The reading activity can be performed by the child himself or mediated by the accompanying adult, the library or health professionals. The activity can be individual or in group, and it can be performed in the beds, in the wards or in physical space of the library. It should be emphasized the importance of these activities for adults, who can seek emotional relief, for example, in religion by accessing bibles and other religious books. Therefore, the infant hospital library exerts a *therapeutic function* when it provides recreational and palliative activities for the mental health of children and adults. In addition, this function can help in the treatment of children's health, besides avoiding new problems such as stress and depression.

The infant hospital library also exerts an *informative function* when providing relevant content to patients and companions about the disease and medical treatment. The librarian, guided by health professionals, can recommend titles with medical, clinical and health information in a language more accessible to users. As a consequence, this function can directly influence the decisions regarding the treatment of the child.

Furthermore, the infant hospital library can exert a *pedagogical function* in cases of prolonged hospitalizations. The librarian can assist the child by providing infrastructure for distance learning, requesting and accompanying daily school activities and providing school supplies. The adult can also benefit from this function through lectures and short-term professionalizing courses offered by the library, such as sewing, crafts and informatics.

To perform these differentiated functions, it is necessary to determine the structure and actions of the infant hospital library. The structure of this type of library consists of its users, librarian and health professionals that interact with each other and to the collections, software, physical space and computers to perform the actions of cataloging, loan, selection and acquisition. However, in reviewing the literature, a concentration of studies on bibliotherapy for hospitalized children and on the informational needs of accompanying adults was found, which leaves, for the best of the authors' knowledge, other parts of the library in the background. Thus, this work aims to investigate the structure and actions of the infant hospital library necessary to carry out its functions and satisfy the needs of its users according to their preferences. In particular to this paper, investigations concerning specialized software, users' reading preferences and collection development policies are presented. A specialized software was developed, which is presented in this paper

as part of the structure, for the management of this type of library. Furthermore, the software was also designed for the study of its users by registering the catalog of the collection, the pairs of users and their loans during two years of service of a voluntary infant hospital library in a Brazilian state public hospital. It enabled the data analysis to provide answers to the following questions. The hospitalized children and accompanying adults are experiencing an atypical situation that influences their emotional states, decisions and preferences. Hence, *what do they prefer to read while hospitalized?* Furthermore, in a voluntary library such as this one, in which the entire collection was the result of donations and no filter was imposed, *how to adapt the collection to meet the needs of its users according to their preferences?* An investigation was performed to identify the users' reading preferences and the results were used to formulate and justify the collection development policies.

The rest of this paper is organized as follows. In Section 2, a bibliographical investigation is presented addressing the hospital library for patients, the therapeutic and informative functions. In Section 3, the structure of the infant hospital library is decomposed into its parts, which are described separately. In Section 4, a detailed account of the actions performed by the library is presented, along with an exploratory investigation of the users' reading preferences while hospitalized. Moreover, a set of collection development policies formulated for the library is also presented. At the end of this paper, Section 5 presents the conclusions and proposals for future works.

## 2 Literature Review

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A literary review of the hospital library for patients biased for studies with hospitalized children and accompanying adults is presented in the following sections.

### 2.1 Hospital Library for Patients

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The *hospital library* is a library located in a hospital that serves a specific user group (IFLA 2000 p. 11). Hence, every hospital can have at least two types of libraries. One of them refers to the *medical hospital library*, intended for physicians, nurses and other health professionals who need to acquire knowledge for the treatment of the patient's physical health (Chen et al. 2011).

The other refers to the *hospital library for patients*, intended for patients to assist in their mental health while hospitalized and to acquire knowledge about their illnesses and treatments.

The earlier progress of libraries for adult patients is reviewed by Rutledge (2015) and reported by others (Perryman 2006 p. 264; Tylor 1895 qtd. in IFLA 2000 p. 7; Wolfgram 1985 p. 33). They become popular during the First World War with the assistance of hospitalized soldiers (IFLA 2000 p. 7). From this on, specialized courses, standards, reports with guidelines, discussions and various publications emerged (Rutledge 2015 p. 20-23; Wolfgram 1985 p. 36). However, it was until the decade of 1980 that the first publications on libraries for children's patients have emerged.

In 1984, a report by the International Federation of Library Associations and Institutions, revised in (IFLA 2000), presented guidelines for hospital libraries for patients of all age groups, with special attention to the elderly and disabled. About the specific needs of children and their companions, it deals only briefly but addressing various topics, such as physical space reserved for children, adapted furniture, qualified employees to serve them, collection with appropriate books and other materials and library services.

In 1988, Schlenther (1988 p. 138) reported that “a recent study shows very clearly the parlous state of existing library services to children in hospital. Many children's wards are found to have only a few shelves of books ‘housed in disarray along with toys. Good literature is lacking [...]. Generally the books are in a poor state of repair, and many are old’”. Then, the author lists three criteria for selecting suitable materials for hospitalized children: a wide selection of “good” books, such as classic books and modern authors; books reporting experiences of children in hospitals and; books that help children with personal problems ranging from the first day of school to divorce and death. However, it does not report how the criteria were determined.

In 1991, a survey conducted by Matthews and Lonsdale (1991), inspired by Schlenther's work (1988), revealed a considerable provision of reading material for children in hospitals in England, but a small number of library services for them.

In 1998, Forrest criticizes (1998a p. 274): “library services for children in hospital have not been nearly so well recorded as those for adults”. Forrest (1998a p. 274) continues with a comment

on Schlenther's experience: "the library services at Bronglais Hospital shine out as a rare, but hopeful, example in an area of librarianship which seems generally poorly developed".

In 2016, Owusu (2016) addressed children in outpatient clinics in a pediatric hospital. The study reports that 92% of them and their families did not know of the existence of the hospital library. However, with the use of a book cart, they began to offer books, magazines, brochures, coloring books and other materials to people in the waiting rooms of the outpatient clinic. The adults reported that it was a useful service to keep the children busy while waiting for the consultation.

It is worth mentioning that the Internet greatly transformed the access to information and the exercise of library functions by the use of new and massive sources of information available on the Web (Thibodeau and Funk 2009). Now, the patients do not depend solely on the information provided by the doctor. They can validate and supplement their knowledge with medical and health information available on various online sources. Initiatives such as the digital pediatric reference library (D'Alessandro and Kingsley 2002), the CATCH project (Harger and Martin 2007) and Tucker's list (2018) help organize, locate and use quality medical information on the Web for patients and families. Moreover, offering tablets for patients with preloaded content on the devices has also been attempted (Almader-Douglas et al. 2017) to facilitate access to health information.

In Brazil, there is government recognition of the need to humanize hospital care as established the rights of all hospitalized children and adolescents (Brazil 1995), which include the rights to "enjoy some form of recreation, health education programs, monitoring the school curriculum during their hospital stay" (Brazil 1995 our translation) and "to receive all the therapeutic resources available for their cure, rehabilitation and or secondary and tertiary prevention" (Brazil 1995 our translation). The infant hospital library may be one of the units responsible for implementing these rights. Even so, a recent bibliographic study (Santana 2018) revealed a scarcity of scientific research on the subject also in the Brazilian literature, as well as of the existence of the hospital libraries themselves for patients in the country. A relevant project, however, is the *Biblioteca Viva em Hospitais* which has "[...] the objective of humanizing the hospital environment and the care of children hospitalized or cared for in outpatient clinics. The intention was to contribute, through the reading action, to a better relationship between patients and health professionals" (Fundação

Abrinq pelos Direitos da Criança e do Adolescente 2005 p. 24 our translation). The initiative benefited 28 public hospitals with pediatric care in the country by 2018 (Santana 2018 p. 29). The experience of the project in one of the hospitals is reported in Carvalho (2018). In a pediatric institute that was also part of the project, the account of Paiva's experience (2015 p. 87 our translation) shows that one can perceive an "improvement in the child's psychological situation" and "stress relief", besides contributing to the "acceptability and treatment of the disease".

The following sections provide more details about the therapeutic and informative functions.

## 2.2 Therapeutic Function

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The therapeutic function of the library attempts to satisfy the need for entertainment of its users. This function is exerted by shifting the focus of the mind from pain and sadness to the execution of an activity. Whether it is reading a book, listening to a song, watching a movie, painting a picture, playing a game, writing in a diary, whatever the activity is, it takes a certain degree of attention to execute it. At this moment, the mind relaxes and the body does not feel the reflection of emotional stress. Each form of activity has its advantages. Reading, in turn, seems to be the most appropriate for the patient in the hospital environment. In general, this activity is silent, requires only that the user be literate, causing a satisfactory sensation for most users, provides several hours of entertainment and it can be performed in bed from a light, cheap and reusable material with many options. In fact, reading is one of the most sustainable forms of recreation for institutionalized people (IFLA 2000 p. 32) and considered, since the beginning of the 19th century, one of the most common practices of therapy, second only to physical exercises (McMillen and Pehrsson 2004 p. 74).

The therapeutic function has a better chance of success if the book is one of the readers' preferences. However, Howard (2011 p. 46) reports, in reference to other studies, that the factors which influence a person's reading choices are not known and that "recreational reading has too long been ignored by the library and information studies community in favor of research into information and information seeking". The author found that one of the uses of recreational reading of young teenagers (12 - 15 years) is to escape a difficult situation, such as accompanying someone

hospitalized, or to escape the routine pressures of everyday life. Besides that, there are several other studies on the children's preferences of recreational reading (Majid 2018; Mohr 2016; Reuter and Druin 2004; Brookshire et al. 2002). However, no studies were found on the reading preferences of hospitalized children and accompanying adults. It should be recognized that it is an atypical situation that influences their emotional states. Hence, it is hypothesized that the reading choices could probably be different, which justifies the investigation in this paper.

Bibliotherapy, on the other hand, can go beyond a simple distraction to the mind. One of the most common methods is the use of fiction stories in which the patient identifies itself with the characters, experiences emotional catharsis to the extent that the characters express themselves and, thus, learn about themselves and communicate about their pains, fears and needs while hospitalized (McMillen and Pehrsson 2004 p. 76). In fact, bibliotherapy goes beyond the simple reading guidance by the librarian. It is more structured, intensive and long-term (IFLA 2000 p. 32). It can be defined as the therapeutic use of literature (Cohen 1993 p. 70) or, more precisely, "that branch of therapeutics concerned with prescribing certain kinds of reading material for certain patients suffering from certain diseases" (Kamman 1939 qtd. in Panella 1996 p. 57). In general, it is practiced by psychologists, librarians, nurses and social workers (McMillen and Pehrsson, 2004 p. 75; Forrest 1998b p. 160), as well as by hospital play specialists (Matthews and Longsdale 1992 p. 15-16). Especially for children, bibliotherapy is indicated for being "highly effective" (IFLA 2000 p. 32), "used for diversion, entertainment, stress reduction, reassurance, and comfort" (McMillen and Pehrsson 2004 p. 75). For more details on bibliotherapy for children, refer to Manworren and Woodring (1998) and Schlenther (1999).

### 2.3 Informative Function

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The informational function of the library attempts to satisfy the need for information of its users. The function is exerted when the librarian provides health information material to adults with relevant and complementary information to those received by doctors and nurses about the condition and treatment of the child.

The users consider the library to be a trustworthy source of health information by relying on the librarian to select quality material to supplement the information provided by the doctor

(Marshall and Williams 2006). A three-year study (Rutledge 2018) on requests for information by patients' families in hospital libraries showed that, in general, informational needs were medical or health-related. The librarian quickly found the information primarily on the Internet or provided it in brochures. Both formats were free to access and free of charge for the families. The book, in turn, is not the main source of medical or health information for the users. It is interesting to realize that some requests were to help with school tasks, which made the library exert its pedagogical function.

Furthermore, it is important to note that the exercise of the informational function causes a therapeutic effect in many adults. Uncertainty, fear and loss of control are the main factors of distress among parents of pediatric patients (Uhl et al. 2013 p. 128) caused, among others, by the lack of information about the situation of the children. For some adults, running out of information about what is going on with the children causes feelings of loss of power, isolation and exclusion in adults (Charchuk and Simpson 2005). Sometimes, when the informational needs were not met, the feeling was that they were not welcome (Ringnér et al. 2011 p. 247). Thus, to deal with these emotions, they usually search for information (Ben-Sasson 2011 p. 415). Some wanted all the information immediately, while others wanted to receive it gradually (Rutledge 2015 p. 32). Moreover, the need for information is constant among all phases of treatment (Jackson et al. 2007 p. 99). When they receive information, many adults felt relief and reduced uncertainty and anxiety (Rutledge 2015 p. 33-35). However, others prefer to avoid knowing because they are not prepared to receive the information (Miller et al. 1988 qtd. in Rutledge 2015 p. 32-33). Not having all the information and handing over the control of these decisions to physicians, decreases stress and anxiety in some adults (Andrews et al. 2005). For more details on adult information needs, refer to Rutledge (2015).

### **3 Methodology**

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The research method adopted in this study was the case study (Yin 2014) of the organization and functioning of the infant hospital library located in the pediatric wing of the *Hospital da Restauração*, in Pernambuco, Brazil. Founded in 1969, the public hospital is a reference for various medical specialties and it is the main unit of the public health network in the state. The library

was created on the initiative of the *Associação dos Amigos da Pediatria do Hospital da Restauração* (AAP-HR) and offers books for patients and companions in the pediatric wards of the hospital. This case study was conducted between the beginning of 2018 and the end of 2019 to conduct exploratory research with a qualitative and quantitative approach on software, users' reading preferences while hospitalized and the collection development policies.

The procedures adopted in the research are detailed as follows. First, a software was developed to manage the library and study its users. An agile software development methodology (Martin 2003) was used, generating 21 revisions during this period. Second, the collection was cataloged and, then, loans of the physical objects of the collection were started. The data was recorded in the software. Third, the data were analyzed to identify the reading preferences of users while hospitalized. The analysis used multidimensional data crossing and data correlation methods to identify patterns. Finally, the fourth step was to formulate policies for the collection development based on the results of the users' reading preference analysis. Each of these steps of the investigation is presented in more detail in the following sections.

## **4 Structure of the Infant Hospital Library**

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*The structure of the infant hospital library is the set of its parts and the relationships between them.* The parts consist of the *people* - users (child and adult), library professionals (librarian and volunteer) and health professionals (doctor, nurse, etc) - and *objects* - collection, software, physical space and computers - which relate to each other to perform the *actions* of cataloging, loan, selection and acquisition necessary for the library to perform its functions and meet the needs of its users according to their preferences. The parts of the library that refer to the objects are detailed in the following sections.

### **4.1 Collection**

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The collection consists of 2,065 titles with 2,250 copies that were donated by the end of the fourth semester of service of the voluntary library. The library also has CDs, DVDs and VHS tapes, but this was not considered in this investigation.

The titles and copies of the collection are classified according to their formats in Table 1. The copies in the book format consist of most of the collection with almost three quarters of the total followed by comic books with approximately one quarter. Together, they represent 97.8% of the collection.

Table 1 - Collection is grouped by the format

<b>Formats</b>	<b>Titles</b>		<b>Copies</b>	
Book	1,485	71.9%	2	72.0%
Comic books	533	25.8%	580	25.8%
Magazine	32	1.5%	34	1.5%
Fascicle	12	0.6%	14	0.6%
Encyclopedia	3	0.1%	3	0.1%

Source: Research data

The titles and copies of the collection are classified according to the category in Table 2. It is noteworthy that some titles have more than one category. The category of children's literature represents three-quarters of the total. The religion category, which deserves attention because of the loans preferences, represents only 4.3%. Together, they represent 80.1% of the collection.

Table 2 - Collection is grouped by category

<b>Category</b>	<b>Titles</b>		<b>Copies</b>	
Children's Literature	1.611	76.2%	2	75.8%
Education	231	10.9%	260	11.3%
Diversion	140	6.6%	153	6.6%
Religion	89	4.2%	99	4.3%
Literature	23	1.1%	24	1.0%
Illustrations	19	0.9%	19	0.8%
Music	2	0.1%	3	0.1%

Source: Research data

The titles and copies of the collection are classified according to the language of the content in Table 3. There are 49 copies (2.2%) in different languages of those in Portuguese from Brazil.

Table 3 - Collection is grouped by language

<b>Language</b>	<b>Titles</b>		<b>Copies</b>	
Portuguese from Brazil	2,016	97.6%	2	97.8%
English	18	0.9%	18	0.8%
Portuguese from Portugal	14	0.7%	14	0.6%
Spanish	12	0.6%	12	0.5%
German	3	0.1%	3	0.1%
Portuguese from Brazil / English	2	0.1%	2	0.1%

Source: Research data

The titles and copies of the collection are classified according to the number of pages in Table 4. Only 1,093 copies have a record of the number of pages. Of these, about 98.0% have less than 100 pages and the copies have a mean of 40.4 pages.

Table 4 - Collection is grouped by the number of pages

<b>Number of Pages</b>	<b>Titles</b>		<b>Copies</b>	
01 - 19	327	32.8%	353	32.3%
20 - 39	241	24.2%	268	24.5%
40 - 59	99	9.9%	118	10.8%
60 - 79	200	20.1%	219	20.0%
80 - 99	108	10.8%	113	10.3%
100 - 119	12	1.2%	12	1.1%
120 - 139	6	0.6%	6	0.5%
140 - 159	1	0.1%	1	0.1%
160 - 179	1	0.1%	1	0.1%
180 - 199	1	0.1%	1	0.1%
200 - 219	1	0.1%	1	0.1%

Source: Research data

The copies of the collection are grouped by the format in Table 5 with the average number of pages computed. Although the book format has more titles and copies than the comic books format, it has less than half of the average number of pages.

Table 5 - An average number of pages of the copies in the collection is grouped by format

<b>Formats</b>	<b>Average Number of Pages</b>
Comic books	68.1
Encyclopedia	66.3
Magazine	54.3
Book	28.8
Fascicle	25.8

Source: Research data

The copies of the collection are grouped by the two most common formats - books and comic books - and by the number of pages in Table 6. It is observed that 91.9% of the books have less than 60 pages and 91.4% of the comic books have between 60 and 100 pages.

Table 6 - Collection is grouped by the format and number of pages

<b>Number of Pages</b>	<b>Copies</b>			
	<b>Books</b>		<b>Comic Books</b>	
1 - 19	341	45.0%	7	2.2%
20 - 39	237	31.3%	18	5.8%
40 - 59	118	15.6%	0	0.0%
60 - 79	28	3.7%	190	60.7%
80 - 99	15	2.0%	96	30.7%
100 - 119	9	1.2%	2	0.6%
120 - 139	6	0.8%	0	0.0%
140 - 159	1	0.1%	0	0.0%
160 - 179	1	0.1%	0	0.0%
180 - 199	1	0.1%	0	0.0%
200 - 219	1	0.1%	0	0.0%

Source: Research data

## 4.2 Software

A management software for infant hospital libraries was developed for the cataloging of the collection, the registration of users and loans, the monitoring of data quality and the monitoring of the actions of the library through a dashboard. The software runs on the library computers in the hospital and transmits the data over the Internet to a database management system installed on a remote server. The structure of the software is presented in the following.

The *catalog* module allows the registration of titles and copies in the database with the following metadata: title, publisher, edition, ISBN, ISSN, year of publication, abstract, language, number of pages, number of copies, format, authors and categories. The record of the movement of the copy - acquisition, donation or exchange - can also be recorded.

The *pairs of users* module allows the registration of pairs of users - hospitalized child and accompanying adult - so that they can take loans. This module records the names, genders and dates of birth of the child and adult. Unfortunately, each child can be hospitalized several times, including with the same disease. Therefore, the *hospitalization* module had to be implemented to associate the pair of users with the numbers of the ward and bed, the date of entry and the exit of each hospitalization of the child.

The *loans* module allows the registration of loans of copies from a pair of users during a certain hospitalization, including the loan date and the indicator of who took the copies, whether it was the child or the adult. The return date is recorded after the copy returns to the library.

The *used bookshop's* module was implemented to register second-hand bookshops for the acquisition and exchange of selected copies. For a voluntary library, such bookshops can make it feasible to adapt the collection to meet the needs and preferences of its users.

The *data quality* module performs data monitoring and auditing. The monitoring is performed by measuring the completeness degree of all fields of all tables in the database. For each field, the completeness index is calculated by the ratio between the number of records with the field filled in and the total records in the table. An innovation developed here is the measurement of the completeness degree of relationships between tables. For example, suppose there is a relationship between authors and books as follows: each author wrote one or more books. Also, suppose that there are 40 authors and 100 books registered in the database. Besides that, just for the sake of illustration, the 100 books are related to only 30 authors, leaving 10 authors unrelated to the registered books. However, when it comes to an author, it has to be related to some book; otherwise, it can be considered incomplete. Thus, the completeness index of this relationship is 30 authors related to some books divided by 40 registered authors. It means that 75% of the authors are related to some book and 25% of them are not. The same reasoning can be applied to the opposite direction of the relationship: each book was written by one or more authors. Hence, the

monitoring also measures the completeness degree of all relationships between the tables in the database. Furthermore, a data auditing technique has also been implemented in which the librarian validates a database record and marks it in the software, making the record line to be displayed in green. The data auditing progress is also monitored in this module.

With data quality control, the *dashboard* can show more accurately the reality of the library. The indicators are constructed using multidimensional data crossing techniques and presented graphically as illustrated in Figure 1. They help recognize librarianship patterns of the structure and actions of the library.

Figure 1 – Software developed for the management of the infant hospital library and for users' study



Source: The authors

### 4.3 Physical Space and Computers

The voluntary library has sufficient physical space to allocate the entire collection organized on several shelves and to carry out its actions. It also has an informatics laboratory equipped with 06 computers configured with Internet access.

The library is available for local access to all its users, but they should be supervised by the librarian or volunteers. It is allowed to consult any bibliographic material in the library itself, including in the computers. In case of interest to take a copy out of the library, a loan should be made. The space also serves as a place to carry out pedagogical actions, such as courses for accompanying adults.

Despite the space, many children cannot leave the wards to visit the library due to the restrictions imposed by the medical treatment. Hence, with a book cart, the library went to its users taking copies to them in the beds, which is one of the actions described in the following section.

## **5 Actions of the Infant Hospital Library**

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The actions of the infant hospital library consist of cataloging, loan, selection and acquisition, which are described in the sequel.

### **5.1 Cataloging**

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Cataloging is the process of describing and structuring information about the copies of a collection. This action requires an effort proportional to the size of the collection and it can be assisted by software. There have been several attempts to use interoperability services with online public catalogs to speed up cataloging, but they did not work for several reasons: either because titles were not found; or metadata was incomplete; or simply because the service was unavailable.

At the beginning of the organization of the library, the collection already contained about three-quarters of the copies acquired by donation. This initial collection was cataloged using the software during the first two semesters of service. The high manual effort of cataloging, even software-assisted, may have led to metadata errors. Thus, data quality monitoring was in constant need of data auditing capabilities. When the loan service began in the third semester, new donations and metadata refinements kept cataloging active until the fourth semester.

### **5.2 Loans**

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The results presented in this section provide answers to the following question: *what do users prefer to read while hospitalized?*

A title that is of the user's preference causes greater interest and willingness to read and, thus, increases the chance of the therapeutic function being successful. Therefore, rather than the librarian supposes, it is better to let users inform about their preferences. Starting from a mixed collection, as presented in Section 3, consisting only of donations without any filter, a small sample of the copies is offered in a book cart each day of loan service for children and adults in the wards to choose at will up to two copies per pair of users. To borrow, they need to inform the data required by the pairs of users' module of the software, as presented in Section 3, where the librarian registers them later. While hospitalized, they can return it at any time and, then, borrow two more copies. As there is no deadline for return, there is no late fine. However, at the time of hospital discharge, the copies have to be returned to the library. Note that the loan is registered to the pair of users, without distinguishing the child from the adult. Therefore, the following results reveal the reading preferences of the pairs of users - the patient and the companion.

During the third and fourth semesters of this investigation, 459 loans were served to 221 pairs of users. The loans corresponded to 353 distinct titles, equivalent to 17.1% of the collection.

The adult assumes an important role during the loan and the reading. The loan policy limiting to two copies per pair of users was determined as such because it was believed that it would be one for the child and one for the adult. However, an observation made during the provision of the loan service is that, in general, the adult chooses the two copies according to the child's preferences. Sometimes, luckily, the same copy may be of interest to both, perhaps in the case of an older child; other times the adult has to read to the possibly younger child. Furthermore, about 95.2% of the loans were requested by the adult and not by the child. In some of these cases, the children who could not get out of their beds asked adults for the copies they were interested in reading; however, in many other cases, the initiative of the loan to encourage recreational reading was from the adults.

Regarding the gender of the children who applied for loans, 56.1% were male and 43.9% female, while adults were 7.7% male and 92.3% female, possibly the mother, or even an older sister or grandmother. It was found that the loans requested by the pairs of users had as patients' children of practically all age groups. It was also verified that these loans occurred uniformly in

the age groups with approximately 2.08 copies borrowed per hospitalization. In fact, during the hospitalization period, about 85.2% of the pairs of users borrowed up to 2 copies (Table 7).

**Table 7 - Hospitalizations are grouped by the number of loans**

<b>Loans</b>	<b>Hospitalizations</b>	
1	56	25.1%
2	134	60.1%
3	10	4.5%
4	17	7.6%
6	5	2.2%
7	1	0.4%

Source: Research data

The loans are grouped by the number of days that the user kept the copy in Table 8. On average, the user kept the copy for 1.4 days. About 76.9% of loans lasted only one day and 93.5% lasted up to two days. It is worth noting that 2.8% of the loans were returned on the same day.

**Table 8 - Loans are grouped by the number of days that the user kept the copy**

<b>Days</b>	<b>Loans</b>	
0	11	2.8%
1	307	76.9%
2	55	13.8%
3	1	0.3%
4	12	3.0%
5	11	2.8%
12	1	0.3%
28	1	0.3%

Source: Research data

The loans are grouped according to the format of the borrowed copy in Table 9. The book was the most chosen format corresponding to 57.7% of loans, followed by comic books with 41.8%.

Table 9 - Loans are grouped by the format of the copy

<b>Formats</b>	<b>Loans</b>		<b>Collection</b>
Book	265	57.7%	72.0%
Comic books	192	41.8%	25.8%
Fascicle	2	0.4%	0.6%
Magazine	0	0.0%	1.5%
Encyclopedia	0	0.0%	0.1%

Source: Research data

Table 10 shows users' preference for choosing between books or comic books formats for reading. About 70.5% of users decide on only one format; only 29.5% prefer to mix the formats.

Table 10 - Hospitalizations are grouped by format preference

<b>Format Preference</b>	<b>Hospitalizations</b>	
Only books	72	43.4%
Mixed	49	29.5%
Only comic books	45	27.1%

Source: Research data

Loans are grouped according to the category of the copy in Table 11. Children's literature was the most requested category corresponding to 91.8% of the loans, followed marginally by the categories religion with 5.4% and education with 2.4%.

Table 11 - Loans are grouped by the category of the copy

<b>Categories</b>	<b>Loans</b>		<b>Collection</b>
Children's literature	423	91.8%	75.8%
Religion	25	5.4%	4.3%
Education	11	2.4%	11.3%
Diversion	2	0.4%	6.6%
Literature	2	0.4%	1.0%
Illustrations	0	0.0%	0.8%
Music	0	0.0%	0.1%

Source: Research data

Regarding the language of the borrowed copies, all were in Portuguese from Brazil. Regarding the number of pages, Table 12 shows that 97.3% of the borrowed copies have less than

100 pages, which is similar to the proportion found in the collection (98.0%). On average, the borrowed copies have 45.8 pages, slightly higher than the amount of 40.4 pages of the collection. It is noteworthy that only 212 borrowed copies had a record of the number of pages.

Table 12 - Loans are grouped by the number of pages of the copies

<b>Number of Pages</b>	<b>Loans</b>	<b>Collection</b>
01 - 19	54 25.5%	32.3%
20 - 39	52 24.5%	24.5%
40 - 59	14 6.6%	10.8%
60 - 79	60 28.3%	20.0%
80 - 99	26 12.3%	10.3%
100 - 119	3 1.4%	1.1%
120 - 139	1 0.5%	0.5%
140 - 159	1 0.5%	0.1%
160 - 179	0 0.0%	0.1%
180 - 199	0 0.0%	0.1%
200 - 219	1 0.5%	0.1%

Source: Research data

The borrowed copies are grouped by the two most common formats - books and comic books - and by the number of pages in Table 13. The distribution of loans is similar to that of the collection (Table 6): books up to 60 pages and comic books between 60 and 100 pages. The average number of pages of the borrowed copies for books and comic books are, respectively, 30.5 and 70.4, which are also close to the average numbers 28.8 and 68.1 of the copies of the collection.

Table 13 - Loans are grouped by the format and number of pages

Number of Pages	Books		Comic Books			
	Loans	Collection	Loans	Collection		
01 - 19	60	42.6%	45.0%	0	0.0%	2.2%
20 - 39	59	41.8%	31.3%	3	3.4%	5.8%
40 - 59	13	9.2%	15.6%	0	0.0%	0.0%
60 - 79	5	3.5%	3.7%	58	66.7%	60.7%
80 - 99	2	1.4%	2.0%	25	28.7%	30.7%
100 - 119	0	0.0%	1.2%	1	1.1%	0.6%
120 - 139	0	0.0%	0.8%	0	0.0%	0.0%
140 - 159	1	0.7%	0.1%	0	0.0%	0.0%
160 - 179	0	0.0%	0.1%	0	0.0%	0.0%
180 - 199	0	0.0%	0.1%	0	0.0%	0.0%
200 - 219	1	0.7%	0.1%	0	0.0%	0.0%

Source: Research data

The only possibilities that the user has for reading are those allowed by the collection. Hence, the influences of the distributions of the collection, presented in Tables 9, 11, 12 and 13, concerning the decision of the user's choice for loan deserve to be analyzed. Pearson's coefficients are, respectively, 0.939 for formats, 0.991 for categories and 0.950 for number of pages, 0.971 for number of pages of books and 0.997 for number of pages of comics. These statistical results suggest that the reading choices present a strong correlation with the structure of the collection. Nonetheless, the users seem to be able to counterbalance the restrictive possibilities of the collection with their preferences. For example, comic books were highly requested in a proportion of 41.8% of the loans against 25.8% present in the collection; the books accounted for 57.7% of the loans against 72.0% in the collection; the children's literature category of 91.8% against 75.8% and; education category of 2.4% versus 11.3%.

The same, however, does not seem to be reflected in preferences regarding the number of pages, suggesting that, perhaps, it is not a relevant criterion for the users' reading choices. However, there is an alternative explanation. It seems that the distribution of the collection already reflects the users' preferences regarding the number of pages. Notice that a comic book is composed of a series of short stories and the books chosen for loans have few pages, about 30, which suggests that each book consists of a short story. Indeed, they prefer titles composed of stories that

can be told in a few pages, or rather, in a few words, because such titles would be compatible with the children's cognitive ability. Therefore, users of an infant hospital library generally prefer to read short stories.

Thereby, adequate development of the collection is important for the library to be able to meet the needs of its users, but it should always reflect their preferences. The policies presented in the next section are responsible for adapting the collection of the library.

### 5.3 Selection and Acquisition

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The results presented in the previous sections are useful to provide answers to the following question: *how to adapt the collection to meet the needs of its users according to their preferences?*

It is an important issue especially for those libraries in which the entire collection is the result of donations with no filter imposed. Therefore, five policies are presented in the sequel to guide the management and development of the collection of an infant hospital library.

*The first policy is to maintain the library with two main collections:*

1. *a physical collection*, which consists of donated copies to satisfy the need for entertainment mainly of the hospitalized children and;
2. *a digital collection*, which consists of references to authoritative websites with free access to medical and health information to satisfy the need for information mainly of the accompanying adults.

The physical collection should be kept around 2,000 copies due to the limitation of the physical space of the library and because it has a maximum of 176 potential users and loans at any moment. Most of the donated copies are for entertainment, as presented in Section 3, but not for medical knowledge. Therefore, since it is a voluntary library with limited financial resources, the informational needs of accompanying adults about the child's illness and treatment can be supplied with online information available on reliable and freely accessible websites. Furthermore, this policy complies with Marshall and Williams' results (2006) and also with Rutledge's results (2018), in which information requested from the families to the librarians could be quickly found on the

Internet. However, if necessary, the information found online can be printed and delivered to the accompanying adult.

*The second policy is to maintain a certain degree of diversity of the copies, due to the need to satisfy a wider variety of individual preferences of the users, ranging from newborns to the elderly.*

*The third policy is to select objects from the collections for disposal or exchange that meet the following criteria:*

- a) with inappropriate content: such as adult content or related to death, suffering or illness;
- b) with content that has different purposes of this type of library: such as technical or academic books, except for those that have health content in a more accessible language;
- c) with more than one copy: not enough data have been collected to determine whether any title is often borrowed that justifies having more than one copy;
- d) with long stories: users prefer to read short children's stories;
- e) of the magazine, fascicle or encyclopedia formats: little interest in these formats was shown according to this research;
- f) of the illustration or music categories: no copies in these categories were requested according to this research; although illustrations may be reconsidered;
- g) in a language other than the native one: the results show that all borrowed copies were from the native language;
- h) degraded or dirty copies.

*The fourth policy is to acquire objects for the development of the collections that meet the criteria complementary to that of the third policy.* In the case of the voluntary library under analysis, when the third policy is applied to its physical collection, 332 copies, about 14.8% of the total, were selected for the first refinement, corresponding to 295 titles or 14.3% of the collection. The selected copies can be discarded, exchanged in used bookshops or assigned for another purpose. For the acquisition, copies in the comic books and magazine formats and the religion and

literature categories will be prioritized to increase diversity. In addition to exchanging in used bookshops, copies can be acquired by donations or by direct purchases.

The selection and acquisition criteria were derived from the investigation of the users' reading preferences, which used data to justified the criteria impartially and impersonally. However, the various age groups, tastes, diseases, titles and other variables make it necessary for this investigation to be continuously carried out, especially after each adaptation of the collection. Therefore, *the fifth policy is that the library should periodically study its users*. It can be suggested to make available other formats, categories and supports, including digital, in smaller proportions to discover new patterns. In this way, one maintains the library, a living organism, always adapting.

## 6 Conclusions

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The infant hospital library was the object of investigation of this paper. This type of library aims to meet the entertainment and information needs of hospitalized children and accompanying adults in order to provide a more appropriate health treatment when exerting therapeutic, informational and pedagogical functions using books, magazines, comic books and other resources. Due to its value, exploratory investigations were motivated concerning the structure and actions necessary for the infant hospital library to carry out its functions and satisfy the needs of its users according to their preferences.

In a bibliographical investigation of the literature, it was observed a concentration of studies on bibliotherapy for children and on the informational needs of adults. The Brazilian literature, in particular, presents, in fact, a scarcity of studies on the hospital library for patients in general and of records of their existence in hospitals in the country. Thus, to the best of the authors' knowledge, there are still parts of the infant hospital library poorly explored, such as specialized software, reading preferences and collection development policies, which were addressed in this paper.

The software developed specifically for the management and users' studies of the infant hospital library deserves to be highlighted. The hospitalization module allows identifying the recurrences of patients. While this module is pertinent to management software of the hospital library

for patients in general, the pairs of users module is particular to the infant hospital library, as it registers the pair of users - the hospitalized child and the accompanying adult. As a result, the fields of registrations and indicators should also consider the relationships between patients and companions. Furthermore, the investigations presented in this paper were guided mainly by data, which were only possible due to the software that enabled the structured recording of a large amount of data about each part and action of the library. The extensive use of data in this work required greater attention to data quality and it should be emphasized because it is crucial for the accuracy of the representation of the librarian reality. Data quality management was assisted by the software which monitors the completeness degrees of the fields and the relationships between tables - an innovation introduced in this paper - and also audits the records in the database.

By looking at the reality of the library using data, the following phenomena were discovered. Adults, usually female, who accompany the child during hospitalization, play an important role in encouraging and assisting recreational reading. Such activity occurred in all age groups of a child and similarly between genders. The choices of users for loan showed a strong correlation with the distributions of the collection. Therefore, given the possibilities for loans allowed by the collection, users preferred to read while hospitalized: literature and religious books, as well as comic books and; native language titles that generally consist of short stories.

These results allowed justifying five collection development policies of an infant hospital library and determining the criteria for the selection and acquisition of copies. It is worth mentioning the first policy which states that the library should be hybrid, consisting of two main collections: the physical collection for the need for entertainment of the hospitalized children and; the digital collection for the need for medical and health information of the accompanying adults. The process of collection development should be impartial, impersonal, continuous and guided by the needs and preferences of users, discovered mainly by means of data analysis.

As a proposal for future work, recording the diseases of the patients in each hospitalization and associating them with each loan would allow the mapping of the reading preference for each disease and, thus, facilitating the therapeutic function.

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Received: 28/08/2021

Accepted: 19/11/2021