Caring-Educational Technology for Pediatric Cancer Patients: "Super Action" in Comics

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Tecnologia Cuidativo-Educacional para Pacientes Oncológicos Pediátricos: "Super Ação" em Quadrinhos

Tecnología Educativo-Asistencial para Pacientes Pediátricos con Cáncer: "Súper Acción" en Historietas

Davi Gabriel Barbosa[1]; Wesley dos Santos Ramos[2]; Daniel Oliveira da Costa[3]; Letícia Lima Branco[4]; Ana Carolina Campos Corrêa[5]; Elizabeth Teixeira[6]; Patrícia Regina Bastos Neder[7]

ABSTRACT

Introduction: Hospitalization and cancer diagnosis are stressful situations for children and their families, as the pursuit of treatment quickly alters their daily lives and future prospects. In this context, the importance of interventions to promote mental and physical health and quality of life for children and their families is evident. **Objective:** To develop a Caring-Educational Technology (CET) in comic book format for pediatric cancer patients undergoing treatment using an integrative literature review. **Method:** A two-phase methodological study: (1) Integrative literature review with the descriptors: "Neoplasms", "Therapy" and "Hospitalized Children". Full-text articles from the last eight years in Portuguese were accepted. (2) Development of the comic book. **Results:** The results obtained from the ten articles included were categorized into: general principles of chemotherapy, most prevalent side effects in pediatric cancer patients, and physical and mental care for these patients. The CET was developed in two parts: the first part tells the story of "Super Action" as the hero fighting cancer, playfully involving the main aspects of the disease, chemotherapy and its side effects. In the second part, the main care that should be prioritized for the child was described. **Conclusion:** The CET is an intervention on the quality of life of pediatric oncology patients undergoing chemotherapy through a better understanding of the disease, its side effects and adherence to treatment, valuing family-multiprofessional support and self-image as the hero of their health.

Key words: Hospitalized Children/psychology; Neoplasms/psychology; Therapeutics/psychology; Educational Technology/methods; Comic Book.

RESUMO

Introdução: A hospitalização e a descoberta do câncer caracterizam-se como situações de estresse para a criança e sua família, de modo que a busca pelo tratamento altera rapidamente a vida cotidiana e suas perspectivas de futuro. Nesse contexto, nota-se a importância da intervenção para a valorização da saúde mental, física e da qualidade de vida da criança e sua família. **Objetivo:** Elaborar uma tecnologia cuidativo-educacional (TCE) em formato de história em quadrinhos voltada para pacientes pediátricos em tratamento oncológico por meio de uma revisão integrativa da literatura. **Método:** Estudo metodológico de duas fases: (1) Revisão integrativa da literatura com os descritores: "Neoplasias", "Terapêutica" e "Criança Hospitalizada". Admitiram-se os artigos completos dos últimos oito anos em português. (2) Elaboração da história em quadrinhos. **Resultados:** Os resultados obtidos nos dez artigos incluídos foram categorizados em: princípios gerais da quimioterapia, efeitos colaterais mais prevalentes em pacientes oncológicos pediátricos e cuidados físicos e mentais desses pacientes. A TCE foi elaborada em duas partes: A primeira conta a história propriamente dita do "Super Ação", o herói que luta contra o câncer, envolvendo, de forma lúdica, os principais aspectos da doença, da quimioterapia e dos seus efeitos colaterais. Na segunda, houve a exposição dos principais cuidados que devem ser priorizados à criança. **Conclusão:** A TCE elaborada é uma intervenção na qualidade de vida do paciente oncológico pediátrico em quimioterapia mediante o melhor entendimento da doença, seus efeitos colaterais e da adesão ao tratamento, com a valorização do suporte familiar-multiprofissional e da autoimagem como herói de sua saúde.

Palavras-chave: Criança Hospitalizada/psicologia; Neoplasias/psicologia; Terapêutica/psicologia; Tecnologia Educacional/métodos; Revista em Quadrinhos.

RESUMEN

Introducción: La hospitalización y el diagnóstico de cáncer son situaciones estresantes para los niños y sus familias, ya que la búsqueda de tratamiento altera rápidamente su vida cotidiana y sus perspectivas de futuro. En este contexto, es evidente la importancia de las intervenciones para promover la salud mental y física y la calidad de vida de los niños y sus familias. **Objetivo:** Desarrollar una Tecnología Educativo-Asistencial (TEA) en formato de historieta para pacientes pediátricos con cáncer en tratamiento utilizando una revisión integradora de literatura (RIL). **Método:** Estudio metodológico de dos fases: (1) Revisión integradora de literatura con los descriptores: "Neoplasias", "Terapia" y "Niños Hospitalizados". Se admitieron artículos completos de los últimos ocho años en portugués. (2) Desarrollo de la historieta. **Resultados:** Los resultados obtenidos en los diez artículos incluidos se categorizaron en: principios generales de la quimioterapia, efectos secundarios más prevalentes en pacientes pediátricos con cáncer y cuidados físicos y mentales de estos pacientes. La TEA se desarrolló en dos partes: La primera parte cuenta la historia de "Súper Acción" como el héroe que lucha contra el cáncer, involucrando lúdicamente los principales aspectos de la enfermedad, la quimioterapia y sus efectos secundarios. En la segunda parte, se expusieron los principales cuidados que se deben priorizar para el niño. **Conclusión:** La TEA desarrollada es una intervención en la calidad de vida de los pacientes pediátricos de oncología en quimioterapia mediante una mejor comprensión de la enfermedad, sus efectos secundarios y el compromiso con el tratamiento, valorando el apoyo familiar-multiprofesional y la autoimagen como héroe de su salud.

Palabras clave: Niño Hospitalizado/psicología; Neoplasias/psicología; Terapéutica/psicología; Tecnología Educativa/métodos; Libro de Historietas.

[1-7]Universidade do Estado do Pará. Belém (PA), Brasil. E-mails: barbosagabrieldavi@gmail.com; wesley23008@gmail.com; danieloliveiradc@gmail.com; letilimabr@hotmail.com; carolina_campos99@hotmail.com; etlattes@gmail.com; patricia.neder@uepa.br. Orcid iD: https://orcid.org/0000-0002-5355-3616; Orcid iD: https://orcid.org/0000-0002-8023-4864; Orcid iD: https://orcid.org/0000-0002-5242-8207; Orcid iD: https://orcid.org/0000-0001-7240-4985; Orcid iD: https://orcid.org/0000-0002-7694-2753; Orcid iD: https://orcid.org/0000-0002-5401-8105; Orcid iD: https://orcid.org/0000-0002-2090-4176

Corresponding author: Davi Gabriel Barbosa. Travessa Perebebuí, 2623 – Marco. Belém (PA), Brasil. CEP 66087-662. E-mail: barbosagabrieldavi@gmail.com

INTRODUCTION

Cancer encompasses 100 different types of malignant diseases with uncontrollable cell growth, eventually invading adjacent tissues and remotely[1]. Currently, is the second cause of death by sickening whose morbimortality varies among countries according to their socioeconomic level and exposure to risk factors associated with social condition and lifestyle. For each year of the triennium 2023-2025, 704,000 new cases are estimated for Brazil[1,2].

Pediatric cancer affects individuals younger than 15 years of age with different frequency and histologic type than in adults. Childhood cancer impacts hematopoietic cells and supporting tissues and epithelial cells of several organs[3] in adults.

For each year of the triennium 2023-2025, 7,930 new cases of pediatric cancer are estimated for children and adolescents. Until recently, an acute disease with poor prognosis, but now, childhood cancer is highly curable[4,5].

Clinically, childhood cancer grows uncontrollably and is more aggressive but responds better to treatment and is usually associated with favorable prognosis with shorter latency. Treatment (chemotherapy, surgery, radiotherapy and support clinical care) is matched to the child metabolism, the biological characteristics of the tumor and curative therapeutic goals even in advanced cases to improve survival and reduce late adverse effects[6].

Treatment adverse events of various types and depending on the volume of the medication can appear few hours after chemotherapy administration, for instance, lack of energy, loss of appetite, weight and hair loss, bruises, nasal and oral bleeding, inflammation of the mucosa, nausea, vomits and diarrhea. In addition, oncologic treatment can cause emotional, social and psychological impacts[6].

For children, life, perspectives and possible choices are dramatically affected by the treatment, they are suddenly withdrawn from social living and enters environments usually seen as odd and painful: hospital, medications and their effects, treatment and invasive procedures pulling them out from school and friends. Therefore, coping methods need to be valued and make the life of the pediatric patient worth with improved quality of life[7].

Health technologies are potential interventions and Teixeira et al[8] define them as "the result of processes originated from daily experience and research to develop an array of scientific knowledge to construct materials or not whose goal is to stimulate interventions about a certain practical situation".

Educational technologies (ET) stand out with the incorporation of technological resources for pedagogic purposes as medias – text, audio, image, animation, video, among others – machines, hardware and networks and every educational-targeted technological resources in addition to theoretical framework for its application[9].

According to BrianCert academy, these tools are classified in three different categories: synchronous and asynchronous, sequential learning and collaborative learning. Additionally, they can be classified as visual impression (verbal) or duplicated, non-projected bidimensional visual, non-projected tridimensional visual, projected visual, audio, video-audio projected in movement (multisensorial), multimedia packages and emerging media[9].

ET can be used to promote healthcare given that skills and knowledge can be continuously improved. They are important because they can systematically determine the development, organization or use of health educational resources and guide the correct utilization of what is being offered. In addition, ET are tools that favor the teaching process towards innovative knowledge exchange[10,11].

Within the context of healthcare evolution, planning health-targeted technologies and implementation have the objective of resignifying the scientific-technical knowledge through processes and tools to disseminate it and improve the quality of life[12].

Health-related posters and comics are educative due to its wide reach, easy-to-use in addition to being inexpensive. Comics are particularly effective to teach complex concepts in a ludic manner, especially for children. A well prepared material is able to address interdisciplinary themes, stimulate the critical thinking and promote learning of new language. However, educational comics should be used cautiously demanding attention in its creation, concepts addressed and communication of the characters because, whether ill-prepared, the consequences can be damaging for health promotion[13].

Comics superheroes can serve as moral, ethical and empowerment examples for children at risk. The image of the superhero in children's imaginary can be utilized in educational interventions in several environments as hospitals, for instance. Further to being an ET, comics are also Caring-Educational Technologies (CET). In the process of care-educate and educate-care, comics may potentialize the autonomy and empowerment of the user, allowing self-care and self-management of care-educate in the hospital daily activity[14].

The objective of this study is to elaborate a comics-based CET for pediatric patients in oncologic treatment through an integrative literature review.

METHOD

Two-phase methodological development study: integrative literature review and creation of a literature review-based CET[15].

The integrative review allowed the articulation of data from empirical and theoretical studies to clarify the definition of concepts, find gaps, review theories and analyze methodologically the studies of a specific theme, and the integration of studies with different methods to expand the options of literature analysis[16]. The modality of the bibliographic analysis selected gathered findings of different methodologies, facilitating the compilation of results without compromising the epistemology of the empirical studies included[17].

This method is an evidence-based tool since the integrative review offers an updated perspective about a specific theme to identify, analyze and summarize the results of different studies, contributing for potential improvement of the quality of the care provided[18]. The review was developed in six phases similar to conventional research[19], based on the descriptions proposed by Matos[16].

The initial phase consisted in the definition of the specific objective of the study, elaboration of the questions to be responded and the hypothesis to be investigated, determining the problem and the research question according to the strategy PICo through key-words also applicable to non-clinical research: P – population or problem, I – intervention and Co – context[20,21].

The population (P) was formed by pediatric cancer patients, family, caretakers and health professionals within the context, the intervention (I) addressed the difficulties, importance of good communication, protocols adopted and what can be done and the context (Co) deals with communication of bad news. Therefore, the research question was: "What type of information about chemotherapy-related side effects of pediatric cancer patients is available?"

On the second phase, the source of the data and inclusion and exclusion criteria have been determined. Upon the definition of the theme and the research question, the search at the databases was initiated; the criteria and methods utilized in the studies were critically evaluated to find which of them met or did not meet the objectives of the integrative review[21] with the descriptors "Neoplasms", "Chemotherapy" and "Children" at the database Virtual Health Library (VHL) which includes MEDLINE, LILACS and BDENF. VHL was selected due to its broad coverage of national and international relevant journals for the study. The inclusion criteria were open access full texts available at VHL in Portuguese, published from 2015 to 2022, a period previously searched at the database by the authors to find matching articles. Case reports were excluded.

Title, objective, results and conclusions of the articles were obtained in the subsequent stage. On the fourth stage, a conventional approach was adopted to analyze the data through questions earlier mentioned. The studies were thoroughly analyzed to ensure the validity of the review, attempting to find explanations for discrepancies.

A fast overview of the articles was followed by a detailed reading to identify the main themes. On the fifth stage, the main results were discussed based on the themes identified with the evaluation tool. The sixth stage included detailed information about the review, aspects related to the topic and specificities of the studies included. Evidences and conclusions were presented as conceptual maps to organize the themes and lastly, the data were summarized and critically analyzed based on the applicable literature.

Comics endear all ages with images and texts that make reading easy and fun, especially for children and young adults. In addition to the entertainment, they help the development of reading, imagination and creativity. Studies show that they are valuable tools for teaching, making complex themes easy to understand[22], for instance, they can clarify the effects of chemotherapy for children, a powerful communication mean that educates and inspires[13].

The creation of the comics involved a preliminary version which addressed the organization of the process of elaboration of an ET, identification of concepts and contents and general organization of the mediatic and textual contents of the comics; this preliminary version was tested later and validated.

According to Teixeira[8], the first steps to produce an ET, after defining the problematic, consist in the contextualization, preparation and creation. Contextualization addresses the decision about the theme, target-population and which scenario will be mediated by the ET (Figure 1).

The elaboration of the technology deals with the selection of the theoretical framework which will be utilized in the comics' content. The ET of the present study will be constructed by the investigator through the method of production, utilizing the literature available to determine the content.

Figure 2 portrays the stages of the creation. The first stage consisted in the creation of the content, grounded on the literature review to ensure its accuracy. The topics for analysis were structured on the most common side effects of pediatric cancer patients and specific care they

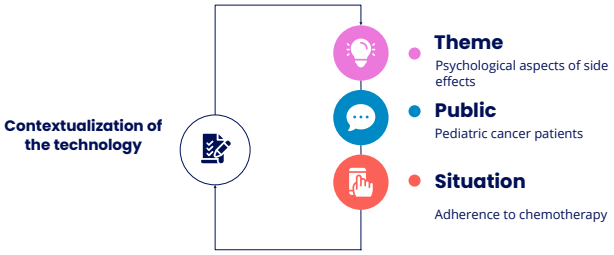

Figure 1. Contextualization of educational technology of the current study

Figure 2. Six phases of the creation of ET

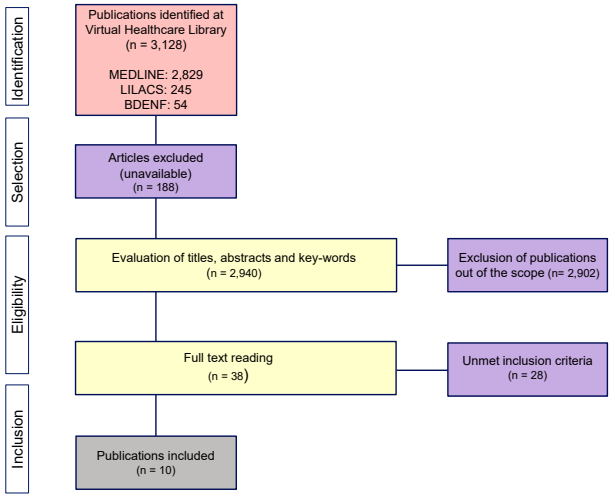

Figure 3. Articles selected for review based on Preferred Reporting Items for Systematic Review and Meta-Analysis (PRISMA)
Source: The Authors, adapted from PRISMA[27].

receive. On the second phase, the preliminary content focused to the essential information, was submitted to editing and layout, consistent with the criteria already established, prioritizing an easy-to-understand, clear and ludic content for the target-public: children.

The third phase presented the illustrations the authors have created with the support of the software Canva[23], Adobe Photoshop 24.7.5[24], Power Point[25] and Paint Tool SAI 1.2.5[26] for the finalization of the non-textual portion with didactic images utilized for its elaboration.

ET testing was made on the fourth stage, evaluated by five nurses and medical students, members of the research group "*Gamificação Aplicada aos Métodos de Ensino e à Saúde (G.A.M.E.S.)*". The final material was reorganized and edited utilizing the strategy of brainstorm.

RESULTS

The diagram PRISMA[27] (Figure 3) was adopted to highlight the general findings of the study. Initially, 3,128 articles were identified without application of filters. After incomplete 188 articles were removed, 2,940 articles were screened; of these, 38 were included after application of filters and later, 28 were excluded for failing to meet the eligibility criteria. Eventually, ten articles were analyzed and reviewed.

The results of the review were categorized according to two thematic subtopics: main principles of chemotherapy, most prevalent side effects in pediatric cancer patients in chemotherapy and specific care for these patients (Table 1[28-37]).

A comics was created based on two approaches. The first described the story within a ludic perspective about cancer, chemotherapy and side effects. The second listed the main care parents should take with their children: feeding, physical activity and playing. In addition, a field "You are Super Action" was included where the child will draw its own characteristics on the image of the hero to portray the self-image as hero of his/her health.

The two-pages, 14x20 cm, front and back, two-colors comics was produced in A4 paper titled "Super Action Against Cancer". It was structured in three parts: front page, narrative in comics, guidelines and interactivity. The last portion was cautiously conceived, highlighting the child' self-image as protagonist of his/her own health, and the care parents should give to their children (Figure 4).

DISCUSSION

Four of the ten articles addressed chemotherapy and side effects of pediatric cancer patients. According to Costa et al.[29], the main objective of cancer treatment is curative or symptoms relief, but if cure is nor achieved, well-being and quality of life of the patients may improve.

Nascimento et al.[29] highlighted that chemotherapy, either curative or palliative is the most common type of treatment for malignant tumors. It is the primary option to treat cancer in children and adolescents, since

Chart 1. Main results of the articles included

Title	Author	Objectives	Main results and Conclusions
Ototoxic medication utilized in pediatric oncologic treatment: systematic review	Caldas et al., 2018[28]	Find which ototoxic medications utilized to treat lung cancer of children are more investigated in the literature, the impact of these drugs on the auditory system and methods to identify damages	Ototoxic medications for cancer treatment have highlighted the importance of monitoring hearing in children because knowing the effects and identify the suitable tests can minimize damages and improve the quality of life. Cisplatin is known by its ototoxicity while carboplatin, though less toxic, can also cause neurosensorial hearing loss, especially in younger children. Aminoglycosides and radiotherapy contribute to ototoxicity with hearing impacts that can appear during and after the treatment, justifying regular follow-up. Liminal tone audiometry is the golden standard test but otoacoustic emissions are more viable and sensitive to monitor hearing of children exposed to ototoxic drugs. It is crucial to perform periodic audiologic evaluations to detect late complications and guide families and educators on possible damages and adjustments as auditory prosthetics
Evaluation of the handgrip strength and quality of life of children with cancer submitted to chemotherapy with vincristine	Costa et al., 2018[29]	Evaluate the handgrip strength and quality of life of children and adolescents with cancer submitted to vincristine-based chemotherapy	Acute lymphoblastic leukemia was the most prevalent diagnosis, unlike other studies that indicate higher incidence in boys. Significant decline of muscle strength measured by handgrip strength after starting chemotherapy, corroborating the importance of evaluating the integrity of upper limbs and global strength. Vincristine-based chemotherapy caused peripheral neuropathy, muscle weakness and decline of the quality of life requiring supervised physiotherapy. Children and their parents perceived quality of life differently, usually parents were most anxious and worried than their children. Similar studies are recommended to improve physical treatment and social aspects of these patients
Physical activity and cancer treatment of children	Freguglia et al., 2016[30]	Physical activities during childhood cancer treatment described by the studies found on the database CAPES (Journals Portal) with the following key-words: *Cancer, Children, Physical Activity* e *Chemotherapy*; text analysis and drafting of the thematic units	The authors highlighted the evidence-based benefits of physical activity on the quality of life of patients in cancer treatment although the different number of patients and ages made results difficult to be proven. Physical activity in hospitals needs to be more explored by the literature because results vary widely, only two studies suggested that the consequences caused neither benefits or harms. Comparison among studies were limited due to different ages, types of cancer and approaches, but there are indications that physical activity can benefit patients without causing any harm

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Chart 1. Continuation

Title	Author	Objectives	Main results and Conclusions
Evaluation of the quality of life of patients with onco-hematologic diseases in chemotherapy	Gomes et al., 2018[31]	Evaluate the quality of life of patients with onco-hematologic diseases in chemotherapy	Global health evaluation of cancer patients revealed poor quality of life mainly because of low scores of emotional function, with depression, concerns and nervousness. Fatigue, insomnia and loss of appetite were the main symptoms reported that negatively impact physical, cognitive, social and emotional functions. These symptoms exacerbated by chemotherapy side effects highlight the necessity of nursing interventions to minimize suffering as psychological support, stimulate good feeding and physical exercises. Actions are meant to improve the quality-of-life of patients during and after the treatment
Evaluation of computer-generated guidelines to caretakers of pediatric patients submitted to chemotherapy	Lopes and Shmeil, 2016[32]	Comparison of guidelines created by the Support System to Clinical Conduct – Oncologic Care and Health with Chemotherapy Drugs with non-technological generated guidelines for caretakers of children in chemotherapy treatment	Analysis of the profile of caretakers and nurses involved with children in chemotherapy indicated that women predominate with similar difficulties regardless of the time caring for these children. Difficulties were not related to education. Nurses age, sex and education did not significantly impact the results but the utilization of the Support System increased the level of agreement and effectiveness of the guidelines provided to nurses and caretakers, improving the adherence to the treatment and quality of the care
The importance of playing for children in chemotherapy treatment and their experience	Morais et al., 2018[33]	Understand the importance of playing for children in chemotherapy treatment	The importance of playing for outpatient children and attention to care that value their potentialities. Playing is a viable tool allowing nurses to understand its importance and ensure its implementation within this scenario. It helps to reduce inactivity and suffering, turning time into something useful and satisfactory. Ludic activities facilitate the formation of affectionate bonds among the nurses and children, favoring individualized care. Despite the difficulties, children see chemotherapy treatment ambivalently associated with pain but hope of cure too
Childhood cancer: profile of the patients attended to at a High Complexity Cancer Unit (Unacon) in Rio Branco – Acre, Brazil in 2017	Nascimento et al., 2020[34]	Describe the clinical and epidemiologic profile of children and adolescents attended to at a High Complexity Cancer Unit in 2017	Description of the clinical-epidemiological profile of children and adolescents, mostly males (60%), Brown color (70%) aged 1-3 years old (45%) treated at the High Complexity Cancer Unit in Rio Branco, Acre in 2017, whose families earned up to one minimum wage (60%). Half of the patients lived in the rural area. Acute lymphoid leukemia (ALL) was the most common cancer type (45%), predominantly treated with chemotherapy (95%). Main treatment side effects were alopecia (hair loss), pain, nausea, paleness and fever. The study highlights the importance of understanding these characteristics for improved humanization of healthcare for this population

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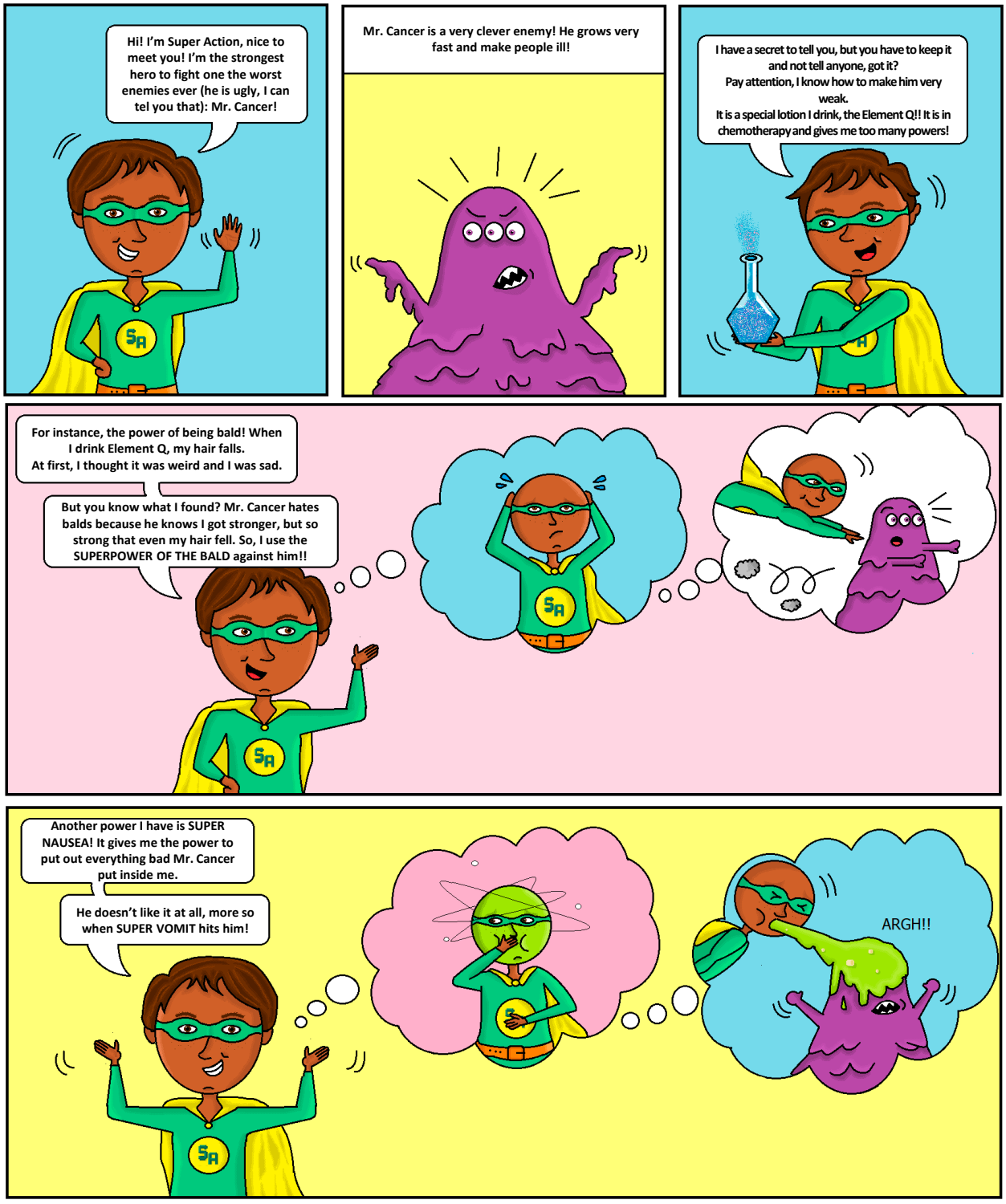
Chart 1. Continuation

Title	Author	Objectives	Main results and Conclusions
Palliative care: prevalence of fatigue in pediatric patients	Oliveira et al., 2017[35]	Evaluate fatigue and quality of life in pediatric cancer patients admitted to the ward in the perspective of palliative care	Most of the participants were males with high incidence of childhood cancer, prevalence of fatigue and health-related quality of life closely associated with each study and populations. Children and adolescents and their parents reported nausea as a common and difficult symptom to control, even with antiemetics. Physical appearance, anxiety and communication were scored low, especially for parents who were more anxious than children. The results suggest that physical symptoms are perceived by children and parents alike but subjective issues are dissimilar, reflecting the emotional complexity of the chemotherapy treatment
Semantic validation of educational technology with caretakers of children and adolescents in chemotherapy treatment	Silva et al., 2022[36]	Validate semantically an educational technology with the caretakers of children and adolescents in chemotherapy	Technology was positive in regard to goals, clarity, language and motivation with high internal consistency (Cronbach alpha = 0.943). Females were predominant in the sample, reflecting the historical role of women as caretakers. Educational technology validated in digital animation media offers an interactive, effective and informative environment about chemotherapy treatment as preparation for therapeutic procedures and improved child care. The validation with the target-public is essential to ensure the relevance and dissemination of safe and reliable information
Nurse care in feeding children in chemotherapy: contributions of Collière	Sueiro et al., 2019[37]	Understand nurse care after change of children's feeding habits due to chemotherapy in the perspective of Collière	The results revealed that change of children's feeding habits due to chemotherapy are challenging for family and health professionals, including nurses. Nursing care should be continuous and rehabilitating to ensure food intake according to Collière. In this context, family should also be guided, further to articulation with the multiprofessional team, medication administration to relieve side effects, evaluation of pain and diet. Strategies include tactic approach to minimize mucositis, encourage the child with dialogue, games, plays and attractive and tasty frozen foods, respecting his/her space. Pursue of different strategies to create a relation of trust with the child and family, know his/her habits, preferences and tastes to meet their needs. A friendly hospital environment for children contributes to minimize the impact of hospitalization and improve the diet

radiotherapy can cause potential long-term side effects on the organic development.

According to Lopes and Shmeil[32], chemotherapy is the main therapeutic approach to treat childhood cancer, providing immediate response because of the sensitiveness of children's tumor cells to this type of therapy. However, Gomes et al.[26] affirm that despite being the main preference, it can be aggressive,

Figure 4. First and second pages of the comics, self-image approach and main care to be provided



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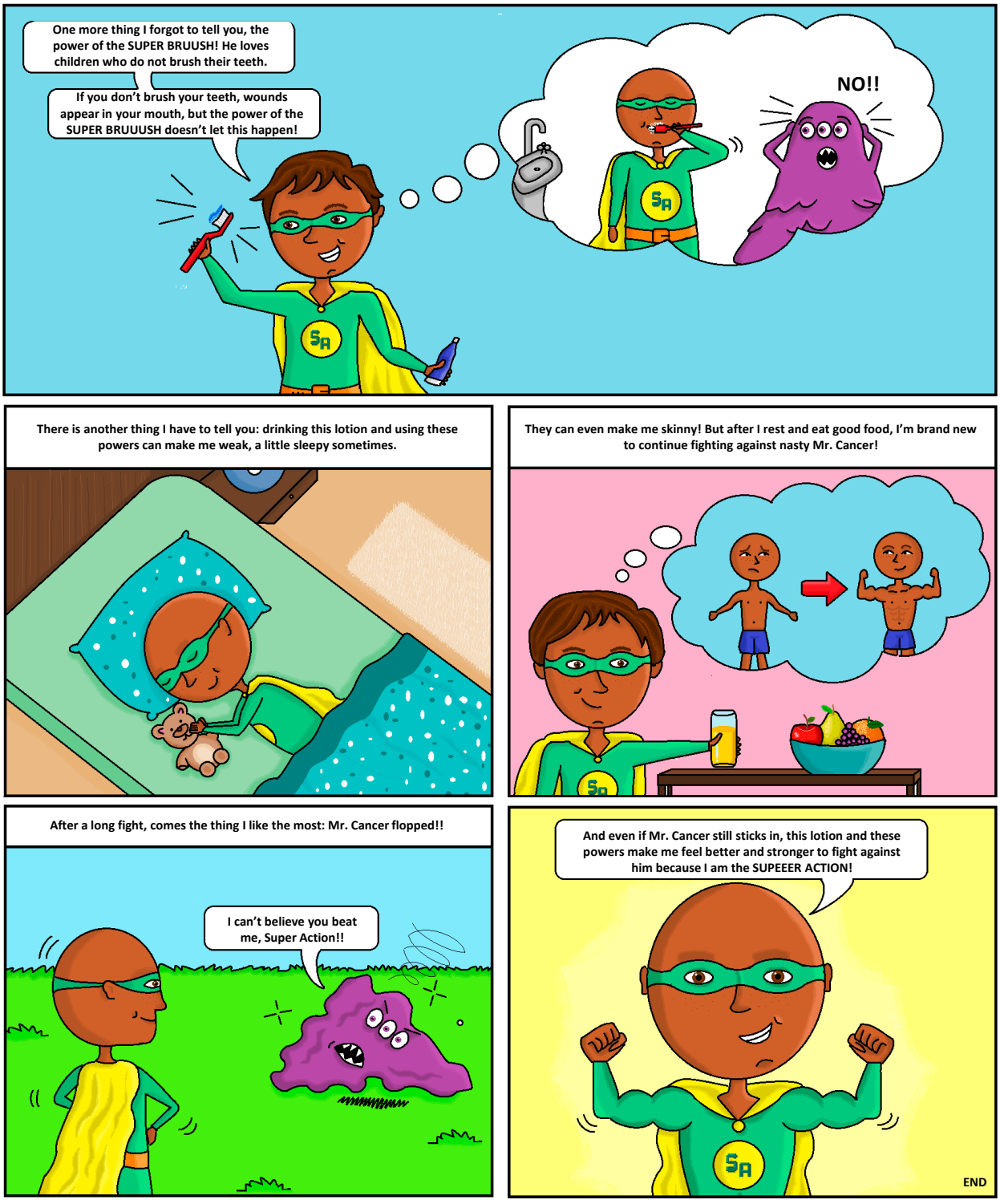
affecting not only cancer cells, but also, healthy cells causing toxicities.

Given the significant impact of chemotherapy, Lopes and Shmeil[32] indicate that its effects can change dramatically the child's daily life, changing from a healthy and active condition to a scenario of disease and impairment. Gomes et al.[26] concur with this perspective, strengthening the concept that it affects physical, cognitive, social and emotional aspects with clear damage to the quality of life. In addition,

Figure 4. Continuation



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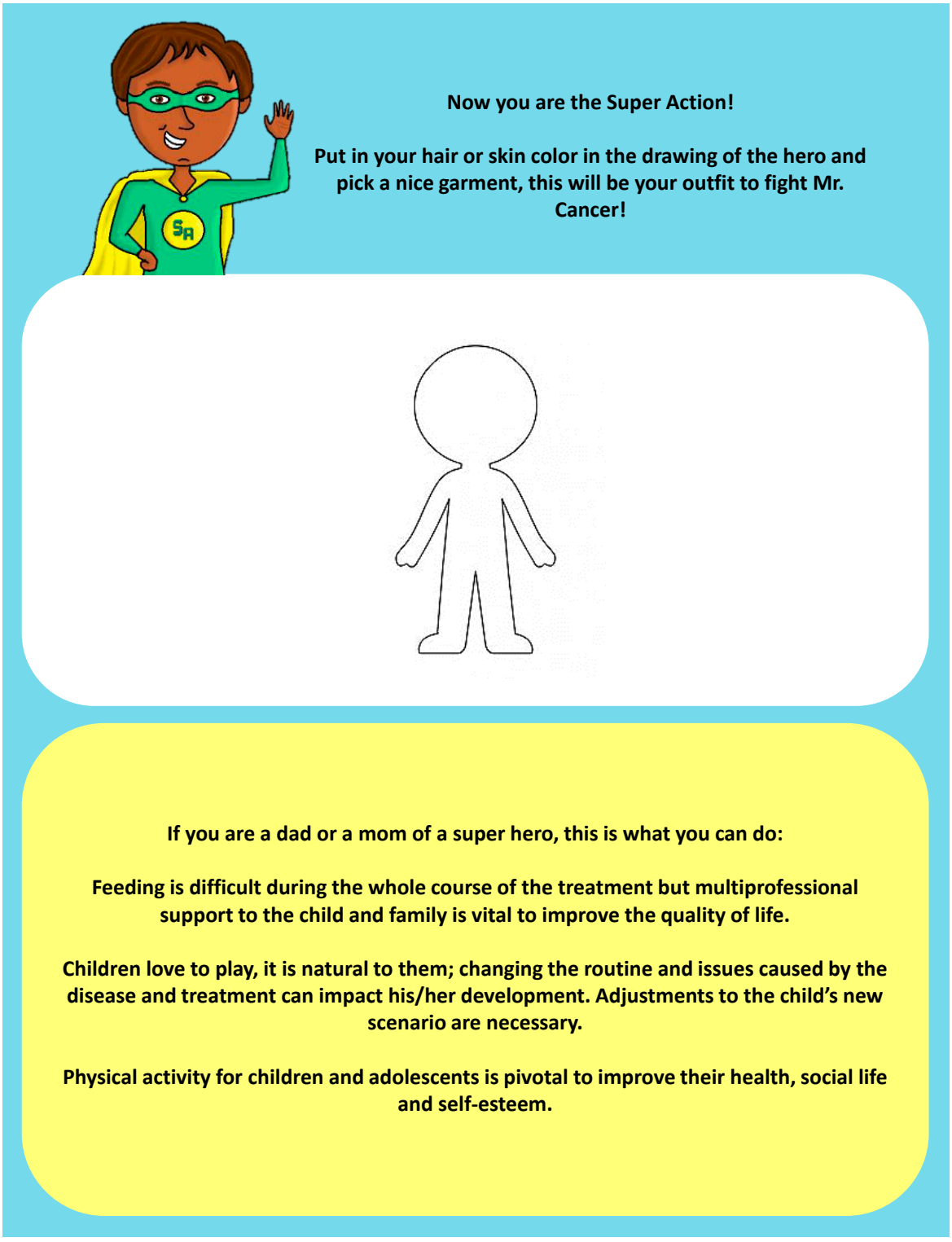
therapy carries fear, sadness and helplessness into the routine of the child and his/her family[29]. Lopes and Shmeil[32] noticed that the participants are barely aware of the chemotherapy medications and required care for children with cancer.

Six of the ten articles analyzed identified the most prevalent side effects for this population in chemotherapy such as:

- Gomes et al.[32]: fatigue, insomnia, loss of appetite, nausea and vomits, pain, constipation and change of the physical appearance.

Figure 4. Continuation



- Nascimento et al.[34]: alopecia, weight and appetite loss, nausea, weakness and fatigue.
- Lopes and Shmeil[32]: nausea, vomit, weight loss, alopecia, bruises, epistaxis, mucositis and diarrhea.
- Costa et al.[29]: decline of muscle strength.
- Oliveira et al.[35]: nausea, vomits, weight loss, alopecia, bruises, epistaxis, mucositis, diarrhea and self-esteem.
- Caldas et al.[28]: nausea, vomits, nephrotoxicity, myelosuppression and ototoxicity.

Four of the ten articles identified the most important overall care for pediatric cancer patients in chemotherapy.

Initially, feeding stands out. According to Sueiro et al.[37], studies indicated feeding issues for children due to one or more chemotherapy side effects: low acceptance, weight loss, failing to meet satisfactory growing standards and difficulties of the family in living this process. Apparently, information exchange among children, health professionals and family is the best option to know the child's new feeding habits within the context of the care provided.

Another aspect addressed is the continuous return to the hospital for outpatient treatment with clear and diverse impacts as pulling away from school and friends, feeding habits, adjustment of the children plays to the new routine and personal mood as consequences of the disease and treatment.

Morais et al.[33] concluded that playing is an integral part of health care not only biologically but also as an important aspect of childhood in its human dimension because it reduces inactivity while in outpatient treatment, circumventing negative thoughts related to the suffering experienced and changing the inactive time into something satisfactory and beneficial; additionally, it creates affectionate bonds between the health care team and the child when emotions and conflicts are expressed freely through dialogue which allows the health professional to fully understand its relevance.

The study "*Atividade Física e Tratamento de Câncer em Crianças*" by Freguglia and Tolocka[30] identified that the child affected by cancer or who had already submitted to oncologic care do not practice physical activity on a regular base due to the hospital routine and treatments, one of the great problems nowadays.

Include physical exercises in the routine of children and adolescents is essential to improve their health and social life, even as inpatients. Improvement of self-esteem and quality of life are the results of the positive effects of physical activities.

Comics created in ancient times are endearing for many age ranges, especially for children and adolescents as an interesting mean to express their feelings and emotions[22].

Stories told as images are one of the most simple and straightforward means to convey ideas, opening a wide range of reading possibilities. In addition, they contribute to the development of the interaction reader-text through a process of discovery, making reading a challenging, and even ludic task, helping to stimulate the production of stories through imagination, interaction among students and a broad vision and analysis of the written and extraverbal language[22].

According to Prado[13], the utilization of comics as pedagogic and informative instrument is relevant, since concepts and themes, although complex and technical, can be assimilated by lay individuals. A well prepared material may present interdisciplinary themes, which, inserted into the cultural context of the target-public can stimulate the critical formation of the reader. The presentation of chemotherapy side effects through comics-based ET has been shown effective, most of all for this population.

CONCLUSION

Cancer treatment is challenging for health professionals who need to be updated in effective strategies to fight the disease and patients who go through a tough process of sickening and are impacted by its magnitude. Sociocultural stigma and fear associated with cancer are a heavy burden to anyone, but the scenario becomes critical when children are involved.

In this phase of their formation, children will learn from experience when they reach adulthood. However, gradual sickening caused by cancer and therapy consequences are clear obstacles, therefore, any tool that attempts to minimize their pain and increase the efficacy of the treatment is valid.

An ET-based comics was created for children in oncologic treatment with chemotherapy to improve their quality of life through better understanding of the disease, its side effects, adherence to the treatment and psychosocial life, valuing the family and multiprofessional support. In addition, the concept of the child as a hero of his/her health was processed in the ET, together with what the parents are expected to do for them while in chemotherapy.

CONTRIBUTIONS

All the authors contributed to the study design, acquisition, analysis and interpretation of the data, wording and critical review. They approved the final version to be published.

DECLARATION OF CONFLICT OF INTERESTS

There is no conflict of interests to declare.

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Associate-editor: Fernando Lopes Tavares de Lima. Orcid iD: https://orcid.org/0000-0002-8618-7608
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