



**Keyla Christina Almeida Portela
Alexandre José Schumacher
(Organizadores)**

Produção Científica e Experiências Exitosas na Educação Brasileira 2

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Athena Editora
2019

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Editora Executiva: Profª Drª Antonella Carvalho de Oliveira
Diagramação: Natália Sandrini
Edição de Arte: Lorena Prestes
Revisão: Os Autores

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Dados Internacionais de Catalogação na Publicação (CIP) (eDOC BRASIL, Belo Horizonte/MG)	
P964	Produção científica e experiências exitosas na educação brasileira 2 [recurso eletrônico] / Organizadores Keyla Christina Almeida Portela, Alexandre José Schumacher. – Ponta Grossa, PR: Atena Editora, 2019. – (Produção Científica e Experiências Exitosas na Educação Brasileira; v. 2) Formato: PDF Requisitos de sistema: Adobe Acrobat Reader Modo de acesso: World Wide Web Inclui bibliografia ISBN 978-85-7247-552-5 DOI 10.22533/at.ed.525192108 1. Educação – Pesquisa – Brasil. 2. Professores – Formação – Brasil. I. Portela, Keyla Christina Almeida. II. Schumacher, Alexandre José. III. Série. CDD 370.71
Elaborado por Maurício Amormino Júnior – CRB6/2422	

Atena Editora
Ponta Grossa – Paraná - Brasil
www.atenaeditora.com.br
 contato@atenaeditora.com.br

APRESENTAÇÃO

Os e-books intitulados “**Produção Científica e Experiências Exitosas na Educação Brasileira**” apresentam 6 volumes baseados em trabalhos e pesquisas multidisciplinares de diversos estudos da educação. A produção científica corrobora para o conhecimento produzido e difundido, além de fazer um papel de diálogo entre os pesquisadores e o meio científico.

Estas pesquisas têm como base os estudos multidisciplinares, que apresentam desafios em seu mapeamento, pois envolvem pesquisadores com distintas áreas de atuação. Diante desse cenário, a Atena Editora aglutinou em seis volumes uma grande diversidade acadêmico científica com vistas a uma maior contribuição multidisciplinar.

No primeiro volume encontramos trabalhos relacionados às vivências, práticas pedagógicas, desafios profissionais, formação continuada, bem como propostas de novas técnicas diante do cotidiano dos pesquisadores.

No segundo volume nos deparamos com estudos realizados no âmbito da educação especial, bullying, educação inclusiva e direitos humanos, bem como com políticas educacionais. Neste capítulo, buscou-se apresentar pesquisas que demonstrem aos leitores as experiências e estudos que os pesquisadores desenvolveram sobre os direitos e experiências educacionais.

No terceiro volume temos como temas: as tecnologias e mídias digitais, recursos audiovisuais, formação de jovens e adultos, currículo escolar, avaliação da educação, mudança epistemológica e o pensamento complexo. Neste volume, é perceptível o envolvimento dos pesquisadores em mostrar as diferenças de se ensinar por meio da tecnologia, e, também, com visão não reducionista, ou seja, o ensinar recorrendo a uma rede de ações, interações e incertezas enfrentando a diversidade humana e cultural.

No quarto volume, encontra-se diferentes perspectivas e problematização em relação às políticas públicas, projetos educativos, projetos de investigação, o repensar da prática docente e o processo de ensino aprendizagem. Os artigos aqui reunidos exploram questões sobre a educação básica abordando elementos da formação na contemporaneidade.

No quinto volume, apresenta-se pesquisas baseadas em reflexões, métodos específicos, conceitos e novas técnicas educacionais visando demonstrar aos leitores contribuições para a formação dos professores e as rupturas paradigmáticas resultante das experiências dos autores.

Para finalizar, o sexto volume, traz relatos de experiências e análises de grupos específicos visando demonstrar aos leitores vários estudos realizados em diversas áreas do conhecimento, sendo que cada um representa as experiências dos autores diante de contextos cotidianos das práticas educacionais sob diferentes prospecções.

À todos os pesquisadores participantes, fica nossos agradecimentos pela

contribuição dos novos conhecimentos. E esperamos que estes e-books sirvam de leitura para promover novos questionamentos no núcleo central das organizações educacionais em prol de uma educação de qualidade.

Keyla Christina Almeida Portela

Alexandre José Schumacher

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EARLY DIAGNOSIS TO THE PEDIATRICS CANCER: THE TELE-EDUCATION IN FAVOUR

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pediatrics cancer for professionals in the family health care in the city of Recife-Brazil. Design: This was a quasi-experimental study, community intervention and quantitative approach, performed from the analysis of the results of before and post-test which was conducted in 2015 and transmitted by webconference in Recife, Pernambuco, Brazil. The participants were 309 professionals working in primary health care, averaging work in this area of 11,3 years. Of these, 79.6% (246) had no training about pediatrics cancer. Main measurements: It was found that the course had an impact positive on knowledge of primary health care professionals about pediatrics cancer. Results: After the course was possible to identify that the professionals were able to correctly answer questions about incidence ($p<0.001$); types, signs and symptoms; factors that influence ($p<0.001$) and network of reference and counter-reference of neoplasms in children and young ($p<0.001$). Conclusions: The telemedicine has shown the driving force in the training of professionals, thus contributing to the qualification from the perspective of early diagnostics, better outcomes and, consequently, the chances of cure and survival of children and adolescents.

KEYWORDS: Neoplasms, Children's Health, Teen Health, Early Diagnosis and Telemedicine.

RESUMEN: Objetivo: evaluar el curso mediante

ABSTRACT: Objective: to evaluate the course by telemedicine about the early diagnosis to the

la telemedicina sobre el diagnóstico precoz de cáncer infantil para los profesionales de la salud de la familia en la ciudad de Recife, Brasil. Diseño: Este fue un estudio cuasi-experimental, intervención comunitaria y enfoque cuantitativo, realizado a partir del análisis de los resultados de antes y después del ensayo que fue realizado en el año 2015 y transmitida por webconference en Recife, Pernambuco, Brasil. Los participantes fueron 309 profesionales que trabajan en atención primaria de salud, con un promedio de trabajo en esta área de 11,3 años. De éstos, 79,6% (246) no tenían ninguna capacitación sobre cáncer de Pediatría. Mediciones principales: se encontró que el curso tuvo un impacto positivo en el conocimiento de profesionales del cuidado médico primario sobre el cáncer de Pediatría. Resultados: Despues de que el curso, fue posible identificar que los profesionales pudieron contestar correctamente preguntas sobre incidencia ($p < 0.001$); tipos, signos y síntomas; factores que influyen ($p < 0.001$) y red de referencia y contra referencia de neoplasias en niños y jóvenes ($p < 0.001$). Conclusiones: La telemedicina ha demostrado la fuerza impulsora en la formación de profesionales, contribuyendo así a la calificación desde la perspectiva del diagnóstico temprano, mejores resultados y, en consecuencia, las posibilidades de curación y supervivencia de los niños y adolescentes.

PALABRAS CLAVE: Neoplasias, Salud del Niño, Salud del Adolescente, Diagnóstico Precoz y telemedicine.

1 | INTRODUCTION

The epidemiological framework of child and adolescent cancer is relevant in the perspective that it is a leading cause of death due to illness in the age group from 1 to 19 years. In Brazil, in biennium of 2018 and 2019, it is estimated that there are close to 12.500 new cases of pediatric cancer per year. The Southeast and Northeast regions will have the highest incidence, approximately 5.300 and 2.900 new cases, respectively.¹

The great challenge that surrounds the care of children affected by cancer is the fact that pathology signs and symptoms in this age range are not specific, that is, they are very similar to the so-called “childhood diseases”. So often, diagnosis is belatedly defined on an easier request.²

What is the previous diagnosis is an effective problem for health professionals. Be properly prepared and trained to recognize the signs and symptoms that characterize child and adolescent cancer.³

Among these professionals, those that permeate Primary Health Care (PHC), primarily those of the Family Health Strategy (FHS), respecting the principles and guidelines of the gateway to the health system, linkage, and care longitudinality, have an important role in the diagnosis and referral to the specialized service of suspected cases of cancer.⁴

We add that most of these do not receive specific qualification in oncology

and also witness few cases of childhood cancer, thus contributing to professional difficulty in suspecting a malignant tumor. This delay, at the conclusion of the correct diagnosis, generates unnecessary referrals, costs, family setbacks, and especially, the less effective treatment in cases of neoplasias.⁵

The advancement of technology is a great ally for the above-mentioned challenges, and through it it's possible for the training and specialization of PHC professionals to exist.⁶

One of these technological tools is telehealth, which aims to support the consolidation of Health Care Networks (HCN) ordered by Primary Care within the Unified Health System (UHS) so called *Sistema Único de Saúde* (SUS).⁷

One of the telehealth services, tele-education, is used to provide new knowledge to health professionals without them having to move away from their work environment for so long. By being carried out by video or web conference, and transmitting to any location as long as it has access to the internet, it will provide a continuing education to FHS professionals, which is fundamental, because it promotes a frequent professional update, helping them to have a better conduct in the environment, both at managerial level and at the care level.⁸

Thus, the study aims to evaluate the impact of the course "Be Alert: Can Be Cancer!", a course for PHC professionals from the Sanitary District II offered in the city of Recife, located in Pernambuco (PE) State (Brazil), in 2015.

2 | MATERIAL AND METHODS

This quasi-experimental research is based on a longitudinal, quantitative approach, carried out by a community intervention, that refers to the application of intervention and evaluation of entire communities, that is, the members of the group will be subject to the same influence simultaneously and to the same type of Trial.⁹

The intervention was carried out between September and November 2015 in the city of Recife (PE) in the Sanitary District II (DS II) for presenting the second highest mortality rate in the study group among the eight existing sanitary districts, according to data provided by the Health Municipal Secretary.

The research population was composed of professionals from the Family Health Strategy (FHS), the Community Health Agents Strategy (CHAS) and the Family Health Support Center (FHSC) of DS II of the city of Recife, in addition to nursing residents in the oncology area of the post-graduate program offered at Oswaldo Cruz University Hospital (OCUH), totalizing 433 professionals.

The course was transmitted to 17 telehealth centers distributed in the territory of the DS II itself, weekly (for 5 weeks), resulting in a total workload of 10 hours, transmitted in real time (synchronous) via web conference by the Telehealth Core (NUTES) linked to the Federal University of Pernambuco (UFPE) and University of

Pernambuco (UPE).

The transmission was carried out through the INDU Platform, programmed by the NUTES, a virtual learning environment that has the objective of continuous education and knowledge propagation in several health areas.

The classes were distributed according to the following themes: National Policy for Cancer Prevention and Control in the Health Care Network related to People with Chronic Diseases, Childhood Cancer Epidemiology, Signs and Symptoms of Early Suspicion, Child and Adolescent with Cancer Primary Care Needed to Health Care, The Role of Primary Health Care, The Organization of the Reference System and Counter-Referral, and the Use of the HealthNET Health Telemetry Platform.

As a way of evaluating the impact of the course, pre-tests (on the first day of the course) and post-tests (on the last day of the course) were applied through a structured questionnaire with the same questions in the two moments. The instrument was prepared by the speakers, in order to check the level of knowledge of the participants.

Data were analyzed by absolute and relative measures, as well as central tendency and dispersion. The hypothesis measures were calculated by the Chi-square Test through a bivariate analysis, whichs independent variables were: the correct answers and errors in the pre-test, adding to the mistakes from those that did not respond. Dependent variables were the same post-test alternatives. A significance level of 5% was adopted and, for analysis, Excel 2007 and Epi Info software version 7.1.5.2 were used.

Those professionals who only performed the pre or post-test, and those who had less than 75% attendance in class were excluded from the study.

The project was registered in the Brazil Platform and sent to the Research Ethics Committee of the Health Sciences Center of UFPE, which was approved under the protocol number CAAE 47801115.0.0000.5208. The research complied with Resolution 466/2012 of the National Health Council regarding research involving human beings. (Figure 01.)

It was selected the Sanitary District II (DS II) for presenting the second highest mortality rate in the study group.

Professionals from the Family Health Strategy (FHS), the Community Health Agents Strategy (CHAS) and the Family Health Support Center (FHSC) were invited and They answered a test before the telehealth intervention.

The course was the first that was transmitted to 17 telehealth centers distributed in the territory of the DS II in real time (synchronous) via web conference by the Telehealth Core (NUTES)

433 professionals participated, of which, 79.6% (246) never had training in the subject of the course

On the last day of the course, the professionals answered the post-tests with the same questions in pre-tests.

It was showed the importance and functionality of telehealth platform and its tools, such as teleconsulting. This platform has as one of its objectives to strengthen the link between the APS professional and the oncology specialist, like a strengthening of a reference and counterreference by telehealth.

Figure 01. Flow diagram of the study

RESULTS

For the course “Be aware: It may be cancer!”, 433 professionals participated, of which, 71.3% (309) formed the study group because they met the inclusion criteria. In this sample, 87.3% (270) were female, 11.3% (35) male, and 1.2% (4) did not identify sex.

Among the participating professionals, 79.6% (246) never had training in the subject of the course; They work in the FHS for an average of 11.3 years, ranging from one to 24 years, with a standard deviation of 4.8. Table 01 describes the characterization of the participants by professional category, highlighting the presence of Community Health Agents, in 50.1% (155).

PROFESSIONAL CATEGORY	N	%
Community Health Agents	155	50,1
Nurses	23	7,4
Technicians and nursing assistants	15	4,8
Doctors	10	3,2
Oral health team: dentist, technical and oral health assistant.	26	8,4
The core team to support Family Health: social worker, physical therapist, speech therapist, nutritionist and psychologist.	8	2,5
Students	6	1,92

No reply	66	21,3
Total	309	100

Table 01 - Characterization of the participants by professional category. Recife, Pernambuco, Brazil, 2015.

In the pre- and post-tests, questions were raised on the childhood cancer epidemiology, signs and symptoms identification, health care network and primary care, as well as interventions to the patient with this type of neoplasia.

Table 02 demonstrates the course's understanding of these professionals in relation to the epidemiology of childhood and adolescence cancer. It was possible to notice that in relation to the issue that addresses the position of childhood neoplasias in the national mortality framework, there was an increase in the alternatives "First" and "Second" cause. In this question, to calculate the p-value, these two alternatives were adopted as correct, considering the information bias by the location of the neoplasias in this age group as the first cause of death by disease. Regarding the factors that influence the time of diagnosis, all questions were statistically significant.

Epidemiology of pediatrics cancer	Pre-tests		Post-tests		p-value
	N	%	N	%	
Cancer is a common pathology in children?					
True	1134'43	36,5	109	32,2	
False	165	53,3	196	63,4	0,011
No reply	31	10	4	1,2	
What is the position of pediatrics cancer (1 to 19 years) within national mortality?					
First	55	17,7	105	33,9	
Second	105	33,9	109	35,2	
Third	59	19	48	15,5	<0,001*
Fourth	22	7,1	16	5,1	
No reply	68	22	31	10	
What type of pediatrics cancer is most common in Pernambuco?					
Leukemias	231	74,7	244	78,9	
Lymphoma	28	9	32	10,3	
CNS cancer	17	9	8	2,5	0,215
Osteorssacoma	1	0,32	5	1,6	
No reply	32	10,3	20	6,4	
What factors influence the time of pediatrics cancer diagnosis?					
ACCESS TO TREATMENT CENTERS					
Yes	194	62,7	223	72,1	
No	29	9,3	30	9,7	0,012
No reply	86	27,8	56	18,1	

LOCATION OF TUMOR					
Yes	159	51,4	212	68,6	
No	41	13,2	31	10	< 0,001
No reply	109	35,2	66	21,3	
SOCIAL SUPPORT					
Yes	106	34,3	141	45,6	
No	64	20,7	63	20,3	0,004
No reply	139	44,9	105	33,9	
TYPE OF TUMOR					
Yes	154	49,8	216	69,9	
No	47	15,2	32	10,3	< 0,001
No reply	108	34,9	61	19,7	
Total	309	100	309	100	

Table 02 – Analysis pre-tests and post-tests in relation to the epidemiology of pediatrics cancer.
Recife, Pernambuco, Brazil, 2015.

* It was considered the “First” and “Second” as correct.

Table 03 demonstrates the course description regarding the knowledge of these professionals about childhood and adolescence cancer signs and symptoms. There was no statistical significance in the question that addresses osteosarcoma, such an outcome may have been due to the symptom “bone pain” refers immediately to this type of neoplasia.

Pediatrics Cancer Signs and Symptoms	Pre-tests N	Pre-tests %	Post-tests N	Post-tests %	p-value
Headache, nausea, vomiting, blurred or double vision, and difficulty walking or manipulating objects					
CNS câncer	190	61,4	220	71,1	
Other Neoplasms	71	22,9	74	23,9	0,01
No reply	48	15,5	15	4,8	
Pallor, fatigue, fever, bone pain, hepatosplenomegaly					
Leukemias	194	62,7	230	74,4	
Other Neoplasms	79	25,5	72	23,3	0,001
No reply	36	11,6	7	2,2	
Leukocoria, low vision, strabismus, protrusion of the eyeball					
Retinoblastoma	212	68,6	255	82,5	
Other Neoplasms	63	20,3	49	15,8	< 0,001
No reply	34	11	5	1,6	
Abdominal mass, hematuria					
Wilms' tumor	131	42,3	178	57,6	
Other Neoplasms	138	44,6	121	39,1	< 0,001

No reply	40	12,8	10	3,2	
Pain in the back and legs, lameness, paresthesia, urinary and fecal incontinence					
Neuroblastoma	105	33,9	144	46,6	
Other Neoplasms	156	50,4	147	47,5	0,001
No reply	48	15,5	18	5,8	
Adenomegaly, fever, night sweats, weight loss					
Lymphoma	137	44,3	188	60,8	
Other Neoplasms	132	42,7	112	36,2	< 0,001
No reply	40	12,9	9	2,9	
Total	309	100	309	100	

Table 03 - Analysis pre-tests and post-tests in relation to the pediatrics cancer signs and symptoms. Recife, Pernambuco, Brazil, 2015.

Table 4 shows the impact of training on the knowledge of these PHC professionals in relation to the primary care that surrounds child and adolescent cancer. After the course, there was a statistical significance with the increase of 12.6% (39) of participants who identified that children and adolescents with cancer cannot take vaccines containing live virus.

Primary Health Care that surrounds child and adolescent cancer	Pre-tests		Post-tests		p-value
	N	%	N	%	
The children and adolescents with cancer in treatment may take the vaccines containing live virus vaccination					
True	76	24,5	48	15,5	
False	214	69,2	253	81,8	
No reply	19	6,1	8	2,5	< 0,001
Fever in children and adolescents in treatment of cancer is a sign of warning to infection and can jeopardize the patient's life					
True	258	83,4	289	93,5	
False	38	12,2	15	4,8	
No reply	13	4,2	5	1,6	0,008
The oncological treatment always cause many debilitating effects related to the gastrointestinal tract. Among these are the mucosites, nausea, vomiting, diarrhea, constipation and anorexia					

True	260	84,1	282	91,2	
False	23	7,4	17	5,5	0,007
No reply	26	8,4	10	3,2	
Total	309	100	309	100	

Table 4 - Analysis pre-tests and post-tests about Primary Health Care that surrounds child and adolescent cancer. Recife, Pernambuco, Brazil, 2015.

Regarding the alternative that addresses the consequences of the pharmacological effect, the statistical significance arises with an increase of 7.1% (22) of those who confirmed that the cancer treatment always causes several debilitating effects related to the gastrointestinal tract.

Table 05 presents the statistical significance of pre and post tests on interventions that should be performed in children with suspected cancer. It was possible to notice that before the course, a large part of the professionals did not know about the referrals of cases through the telehealth platform, since there was a significant increase with 28.2% (87) of those who, after the training, recognized this functionality of the platform.

Interventions that should be performed in children with suspected cancer	Post-tests				p-value
	Pre-tests	N	%	N	
In case of suspicion, to send the case by telehealth platform					
Yes	151	48,8	238	77	
No	44	14,2	26	8,4	<0,001
No reply	114	36,8	45	14,5	
Domicilares visits, identify warning signs and symptoms					
Yes	245	79,2	271	87,7	
No	19	6,1	12	3,8	0,004
No reply	45	14,5	26	8,4	
Total	309	100	309	100	

Table 05 - Analysis pre-tests and post-tests about interventions that should be performed in children with suspected cancer. Recife, Pernambuco, Brazil, 2015.

DISCUSSION

Childhood cancer is considered a rare disease, yet it is the leading cause of death due to illness in Brazil, only ranked behind accidents and violence. We believe that in the issue that addressed this theme there was an information bias by relating it, either to the first cause of illness or to the second cause of death in general.¹⁰

Leukemias are the most frequent neoplasia in this age group. In leukemias

occurs the accumulation of defective cells in the bone marrow, and consequently the production of red blood cells is impaired, or even there is no production. This is what causes anemia (which is characterized by pallor as a sign), fatigue, palpitations and joint pain in the lower limbs.¹¹⁻¹² Fever is another symptom that affects children with leukemia and the differential diagnosis for this type of cancer is infection.¹³

Many factors influence the time of diagnosis of neoplasms in children and adolescents. Access to treatment centers is one of them, since most patients arrive with the disease in an advanced state, this is due to the fear of the diagnosis that generates the denial of symptoms and results in not looking for specialized centers. There is also difficulty in entering the centers because of non-alignment in the reference and counter-referencing of service networks.¹⁴

Another factor that is linked to this probability is the deficit that professionals have in diagnosing this pathology, since the location and type of tumor often has a rather nonspecific clinical presentation, generating similarities with the diseases described in childhood and this makes it difficult to recognize the pathology by professionals. The research participants show a certain degree of knowledge related to the factors mentioned above.

It was possible to observe that PHC professionals had weaknesses in the identification of early suggestive signs and symptoms of childhood cancer. This may be a consequence of the academic training still focused on the morbidity and mortality previously stigmatized by diarrhea and malnutrition, which were both responsible for infant mortality.

It's primordial that PHC professionals receive a permanent education, since in the curriculum, both in higher education and in technical courses there is little or no information on the identification of childhood and neoplasia.¹³

Given data obtained in the pre and post-test it was clear that after the course there was an improvement in the participants' perception relating the type of cancer with the signal and symptom for it. When reported on CNS cancer, symptoms such as vomiting and headache are related as well as motor changes, behavioral changes and nerves paralysis.¹³⁻¹⁴ Children who present aggressive and severe headache in the morning and who are accompanied by vomiting should be carefully analyzed.¹¹

Retinoblastoma is a rare ocular tumor, which usually affects children under one year of age and its most specific characteristics are leukocoria and strabismus. The significant value in the professionals' knowledge is very relevant because when detected in its intraocular degree the treatment has better efficacy.¹¹ The same occurs in the symptoms related to abdominal mass and hematuria that are associated to Wilms' tumor, being able to reach only the Kidney (stage I) or, if not early diagnosed, also affect adjacent tissues (stage II).¹⁵

Neuroblastoma, which by its name is easily mistaken as a tumor in the CNS, presented statistical significance in the early identification of symptoms: back and leg pain, lameness, paresthesia, fecal incontinence, and urinary incontinence. 30%

of this neoplasm initially reaches the suprarenal glands, and 25% of the lymphatic ganglia of abdomen sympathetic nervous system.¹⁶

There was an increase of 16.5% (51) regarding to the professionals who correctly related the signs and symptoms of lymphoma. This neoplasia affects the lymph nodes that are responsible for organism defense, it is the most incident in childhood and, in the last 25 years, the number of cases has doubled without known reasons.¹⁷

In the approach on health care network and primary care to the patient with childhood cancer, a great impact was observed. It was important to make professionals aware that oncology patients being treated should not take live virus-containing vaccines. If epidemiological conditions are necessary, non-live vaccines should be administered during treatment, but they must be repeated after treatment so that the immune response is adequate. After three months the treatment is concluded, depending on the clinical situation, the patient can use live, bacterial or viral vaccines.

¹⁸

Another very pertinent point was to emphasize that cancer patients suffer from series of adverse effects, among them there are nausea and vomiting that are quite frequent in this type of patient because of the medication type used, the route of administration and also the speed in which drug is administered.¹⁹

The answers about interventions that must be made by APS professional showed that little was known about the importance and functionality of telehealth platform and its tools, such as teleconsulting. This platform has as one of its objectives to strengthen the link between the APS professional and the oncology specialist.²⁰

In-person training has generated many results; in addition, it is believed that these results can be enhanced through new mechanisms that subsidize training and monitoring, providing PHC professionals with the possibility to identify patients with signs of suspected childhood cancer, providing to them a better prognosis of cure.²¹.

3 | CONCLUSION

The course Be Alert: Can Be Cancer! contributed to the early suspicion of signs and symptoms of childhood cancer with the contribution of Telehealth in the perspective of its reach and recognition of this tool as a potential approximation between levels of attention.

However, for its effectiveness, it is observed the need for better connectivity in health units, a solidification of a care line for suspected child and adolescent cancer in the state of Pernambuco, insertion of educational institutions in a training focused on early identification of neoplasms and strengthening of a reference and counterreference by telehealth, decreasing as cost, and avoiding unnecessary displacements.

In this way, it is urgent to extend this project to other health districts located in the city of Recife, as well as other cities situated in Pernambuco State with a

sustainability purpose and the achievement of equity in regional perspectives.

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Agência Brasileira do ISBN
ISBN 978-85-7247-552-5



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