# PRODUCT DEVELOPMENT FOR RESPIRATORY PHYSIOTHERAPY SUPPORT AND VISUAL STIMULATION FOR CHILDREN WITH ZIKA VIRUS CONGENITAL SYNDROME

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## 1. Context

Due to the high percentage of brazilians that showed some kind of special need, which in most of these cases are motor disability and, considering that many of them don't receive any income or receive just a minimum salary, becomes visible the need for assistive technology as a way for improving the life of the disabled population. Bringing inclusion and a possible independence, besides decrease the difficult found by professionals and families in the realization of their activities with the patients.

The project was made based on the study of the Congenital Syndrome of Zika Vírus (CSZKV), a single pattern of congenital disabilities found in fetus and babies infected by the virus during the gestation period. The child that has the CSZKV develop conditions that interfere in all activities in their entire lives, since their birth. Among the conditions of this syndrome, there is the difficult related to breathing, being necessary the use of a manual therapy technique that helps the ventilation in the lugs, promoting the removal of the secretion in the airways and strengthening of the breathing muscle through physiotherapy. The goal is to introduce a solution to the difficult that families and health professionals find when trying to adjust the children in commun or adapted chairs to realize the respiratory physiotherapy.As this children don't have control of their heads and their trunk, the use of commun chairs is inappropriate to give them, the support that they need.

This project was developed analysing a case inside the child physiotherapy space from a physiotherapy and rehabilitation institute, that showed a great need of donations of resources. In the location was seen the respiratory treatment of these children, that need to reorganize their thoracoabdominal balance through coordinated exercises by professionals, in a shared room with other patients from differents treatments. To a better understanding of what could have or could not have been done, long conversations were essentials to elaborate a product that allow the realization of the treatment without interruptions.

## 2. Method

In partnership with the physiotherapy and occupational therapy institute, a group of four students, two project supervisors that helped in the ergonomic and design proposals, and two health professionals that helped for orientation about the disabilities, difficulties and patients diagnosed with the CSZKV, contributed for the creation of a product through assistive technology. Visits were made to the place, where the group

accompanied the treatment of two patients to be able to understand the issues related to the selective treatment with the institute team. The project had the duration of four months in which visits were made, the proposition of the product and it's test.

It was opted to develop the project in an approach that could evolve the users on the understanding of the problems and development of solutions, where is possible the participation in all the stages of the project following Guilherme Santa Rosa: Design Participativo methodology. The method used for analyses and development of this project was the Intervenção Ergonomizadora (Moraes e Mont'alvão, 2010) because it allows an investigation of the work circumstances, making it possible to argue and propose modifications that improve the life quality of the patients.

The stages of the method involve the ergonomic appreciation, diagnosis, ergonomic projection and ergonomic validation. The ergonomic appreciation of this project seek to clarify the problems found during the monitoring of the sessions, concluding the hierarchy of problems to be diagnosed. The diagnosis focus on the prioritizing problems considering the environment that the sessions occurred and the data collected. The ergonomic projection has started from the realization of interviews with the professionals and families to better understand the difficulties that were observed and debate the priorities to these project, and then, define the dimensions, physical characteristics components and arrangements to the creation of the prototype. For the validation stage, were organize visits with the purpose of evaluation of time in which the patients stayed in the chairs and how they maintained themselves while the treatment is happening.

## 3. Results

To know if the product obtain the expected result assisting in the respiratory physiotherapy and bringing comfort to the patients, a validation was made by positioning the children on it and analysing how which one of them adapted themselves, maintaining the trunk and head estable using the resources that the chair provides to help on the treatment. According to the expectations, the procedure occurred without interruptions to adjust the posture and optimization of the treatment time, besides giving great assistance to other activities on the life of their users, such as feeding, contact with toys, activities that stimulate the eyesight, among others.

The result was beyond what was foreseen when was observe that interest arose from other patients from the institute towards the product, even out of age range and pathology studied in which the product is for. The Project provided the use of the product for many patients despite the possible differences in body structure and size of each one, differences from both age range and others disabilities, due to the chair being able to conform to the body. The fact that the structure is able to bend and have removable parts, was also extremely helpful for storage and motion of the product, improving the use of space at home of in the institute.

## 4. Conclusion

Inside the respiratory physiotherapy area, in which the physiotherapy is used as a way to prevent muscle weakness and recover functional capacity, there are many difficulties and limitations, especially with patients in critical state, and because of that, health professionals search for assistance in the solution of this limitations that occured from the different pathologies that need support in this respiratory field. *Comfy Bee* was created as a way to bring comfort to the patients affected by the syndrome and similar pathologies due to time in which they are sitting, decreasing the chances of more harm to their health.

After all the analysis, the project execution and due to the fact that Congenital Syndrome Associated with Zika Virus is still strong in these days, we realize that is possible to create and adapt many projects that can provide the help and support to the respiratory treatment, breaking the barriers that limited children with this disability. This field of assistive technology allow us to create new projects through a collaborative network that can help simplify the lives of countless people around the world, bringing a better quality of life, making their treatments easier and softening their difficulties. The project has showed the importance of interdisciplinary in the health area, rehabilitation and Ergodesign, making clear about the great positive impact in the patients lives.

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