

Review Article

Experience Report: Physiotherapy in the Pediatric Intensive Care Unit during the COVID 19 pandemic

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Keywords

- Coronavirus
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Abstract

Objectives: To describe and discuss the experiences and moments lived in a public Pediatric Intensive Care Unit (PICU) in the countryside of Mato Grosso do Sul at the beginning of the COVID 19 pandemic in Brazil; with a view of the pediatric intensive care physiotherapy; describing the challenges generated in face of an adaptive and pandemic environment. As a theoretical reference, Callista Roy's Adaptation Theory was used, and occurred in the period from March 2020 to December 2021. The demand for admissions of respiratory causes between the months of May and June 2020 were 8 (7%) admissions/month (year 2020), a low amount if compared to the same period of the previous year 42 admissions (72%) (year 2019); being in these months considered of high prevalence for seasonal infections by respiratory syncytial virus, responsible for the majority of hospitalizations in infants. It was possible to consider that one of the challenges was the need to adapt to the new safety measures, severity of cases, humanization, and personal insecurity due to the difficulties faced by the lack of a trained team and material and human resources; and the assistance challenges due to the lack of protocols, flows, and appropriate management for these patient profiles, making the work routine difficult. Close to two years after the pandemic, it was possible to consider that the "unknown" became "controlled", because the team facing suspected and/or confirmed cases of COVID 19 was better prepared for the confrontation, the experience, courses, and training meetings and continuing education made the environment more capable of adjusting to changes and situations. However, future studies will be necessary to evaluate the post-pandemic stress in health professionals and the seasonality of respiratory viruses.

ABBREVIATIONS

PICU: Pediatric Intensive Care Unit; **EPIS:** Personal Protective Equipment; **CPAP:** Continuous Positive Airway Pressure; **COVID -19:** Corona Virus Disease-19

INTRODUCTION

In Brazil, the first contamination by the new Corona virus was identified at the end of February 2020, and on March 20 of the same year, the state of community transmission was declared throughout the national territory and recommendations for social isolations were made through Ordinance No. 454 of 2020. In Mato Grosso do Sul, seven children between 5 and 11 years old have died from Covid-19 since the beginning of the pandemic. The numbers were counted until January 2022 through the state's death records, while in Brazil the total number of deaths in children aged 5 to 11 years totaled 324 deaths since the beginning of the pandemic [1].

Contextualizing the ICU of this experience report, we have that it is a pediatric ICU (100%) SUS with 10 beds currently active and a year before the beginning of the pandemic by COVID

19- (2019) the average occupancy rate was 60%, and in the year the pandemic began in Brazil this rate fell by half (30%), thus suggesting that social isolations in the pediatric public (children aged 1 month to 12 years) decreased infections by other viruses, reducing the demand in the PICU. A study conducted in England at the beginning of the pandemic in April 2020 brought that the low demand for intensive care beds for children, combined with the high demand for adult beds, temporarily transformed the pediatric ICU into adult ICU [2]. And it is important to emphasize that the high demand for PICU beds follows a seasonal pattern, with an increase in unplanned respiratory admissions during winter; however, there is a scarcity of national data on this issue [2].

This adaptation of the new care mode in the hospital environment can be explained by Callista Roy's Adaptation Theory in which this was used as a guiding theorist of this experience report occurred in a PICU of a public hospital, and describes that; we follow four adaptive models for changes [3].

These models are behavioral changes that lead to the adaptive process that are: the physiological, which concerns the

chemical and physical processes; of self-concept that involves set of beliefs and feelings about oneself; of function that focuses on the roles that the person occupies in society; and, finally, of interdependence, centered on the close relationships between people and their purpose, structure and development [3].

Roy's Adaptation theory also brings that professionals need to be empowered to deal with difficulties of ambience with each change in the environment, ensuring a substantial improvement to health services and the well-being of patients and their families. Adaptation as responses promote integrity and help people to achieve goals, that is, the ability to manage the environment in order to obtain a regular level of well-being and health, even in the face of pandemic stress [4,5].

Humanization actions and solutions to minimize the harmful psycho-emotional effects of hospitalizations in pediatrics are encouraged and sought in all PICU (Pediatric Intensive Care Unit) admissions; however, throughout the pandemic context, these actions had to be reinvented and adapted to the new environment and situation, in order to seek strategies that would minimize the setback in the humanization action, such as (monitoring of parents) [6].

The role of the physical therapist facing this current pandemic was in prevention, ventilatory management, rehabilitation of pulmonary, cardiovascular, metabolic and functional adjustments in the limitations of activities of daily living acquired during hospitalization [7-9].

All pediatric physiotherapeutic care must be based, in addition to technical knowledge, on the formation of a bond, involvement and open dialogue with the child and his family. And as an integral part of the multidisciplinary team, physiotherapy participates directly or indirectly in different actions of humanization, such as stimulating and facilitating the exit from bed, adapting the routines of care respecting the time of rest and sleep of children, facilitating the application of the kangaroo method among others [5,10].

Thus, in face of this adaptation context, the objective of this report was to describe and discuss with other authors about the experiences in a Pediatric Intensive Care Unit (PICU) during the pandemic of COVID 19 in Brazil, in the view of intensive physiotherapy, and to demonstrate the practical challenges generated in the assistance in this new adaptive environment of the pediatric public.

PRESENTATION OF THE EXPERIENCE REPORT AND DISCUSSIONS

The experiences occurred between March 2020 and December 2021, and the care practices were based on clinical protocols of the institution and observations of sector demands and exchange of experiences with other colleagues in the area, in other institutions that experienced the same scenario, fostering reflection on current practices of pediatric intensive care physiotherapy in the face of the pandemic COVID 19. These exchanges occurred in specific groups of specialists in the field of pediatric intensive care in workshops and virtual meetings [11].

As soon as the state of public emergency was declared and

published through the national law No. 13 979 OF FEBRUARY 6, 2020, which provides for the measures to deal with COVID 19, and also the municipal decree No. 3.032 OF NOVEMBER 27, 2020" which recommended the closure of churches, bars, restaurants, stores, schools, universities among many others; the pediatric ICU of this report initially experienced two months totally atypical of recent years [12,13].

In a totally seasonal period for high demand of respiratory infections, mainly due to the increase of cases every year for bronchiolitis and pneumonia; the demand for admissions of respiratory causes between the months of May and June 2020 were 8 admissions/month (7%) (year 2020), a low amount if compared to the same period of the previous year 42 admissions (72%) (year 2019); being in these months considered of high prevalence for seasonal infections by respiratory syncytial virus, responsible for most admissions in infants (Figure 1).

This reassured the team, and concomitantly; new information emerged with more evidence, highlighting that the infection and aggravation in the pediatric public were around 5% of confirmed cases, most of them being children with some chronic disease and/or weakened immunity [9].

According to the guiding theory of this report, the basic knowledge consisted in understanding the adaptation of people, and work processes and consequently the adaptation of the new way of living and working. In this scenario, physical therapy was a professional category that became indispensable in the front line; because the country needed qualified labor to handle various models of invasive and non-invasive mechanical ventilators and to deal earlier and more agile in the management and respiratory control of these patients [8,14].

Professionals have been faced with the need to act in more than one job with the development of protocols, guides, recommendations, "online" courses, "lives", management videos to the patient with COVID 19, among others, overloading this category [14,15].

Conducts with the best scientific evidence previously complied with and respected were astonished in the face of the new world scenario, with conducts initially based on the experience of other countries, because there was not enough time to direct evidence-based interventions such as systematic reviews and clinical trials [9,16].

Another adaptation was in the humanization of adult and pediatric care, of which they had to adapt so that the National Humanization Policy of the Ministry of Health of Brazil was respected, which impacted the hospitalizations of children who, before this scenario, had an environment closer to the ideal regarding this policy [5,6,10].

Among the humanization actions are: allow the presence of the mother or other companion in full time; facilitate visits at alternative times; promote breastfeeding in free demand; stimulate and facilitate the exit of the bed; reduce noise; promote the privacy of the patient and companions; provide natural light and measures for adequacy of routines [5,10].

Faced with a scenario in discovery, with the presence of a highly contagious and devastating virus, brought psychological

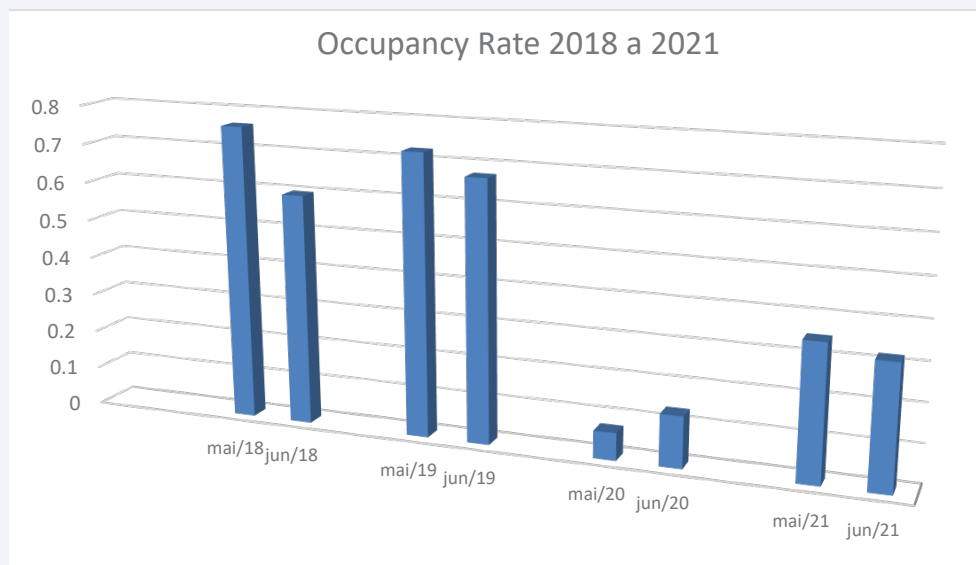


Figure 1 Depiction of the study PICU occupancy rate during the onset of the COVID 19 pandemic.

consequences for the health professional; that before this whole context, lived a peaceful, safe and humanized work environment; and this was adapted to each institutional and public reality during the pandemic period. Each institution readapted its actions according to the demand of cases, an example were the cases of some pediatric ICUs in Brazil and in the world that needed to cede their beds to care for adult patients. The challenges of care for compliance with protocols, flows and proper management of these patients made the work routine difficult; besides the fear and apprehension of getting contaminated [16].

Among the challenges and adaptations faced exposed in Figure 2; were dealing with fear of contamination in physiotherapeutic care and interpersonal relationships in the sector, which resulted in anxieties for fear of making themselves and their families ill. Corroborating the literature, which also brought some reports

that confirmed that we were not alone in this psychic suffering (18).

In this context, the PICU of the study experienced days of several professionals on leave due to infection of COVID 19, even though there were not frequent cases of admissions in the unit, arousing the anxiety of other colleagues to contract the virus at a time of pure fear and fragility.

Another challenge was the advanced life support actions, which led to the need for several adaptations, because the professionals needed to be more attentive to the procedures so that the team would not be contaminated. And the great dilemma was the situations of cardiorespiratory arrest and definitive airway approach (OTI), a procedure that generates aerosols and is a potential viral transmitter [9].

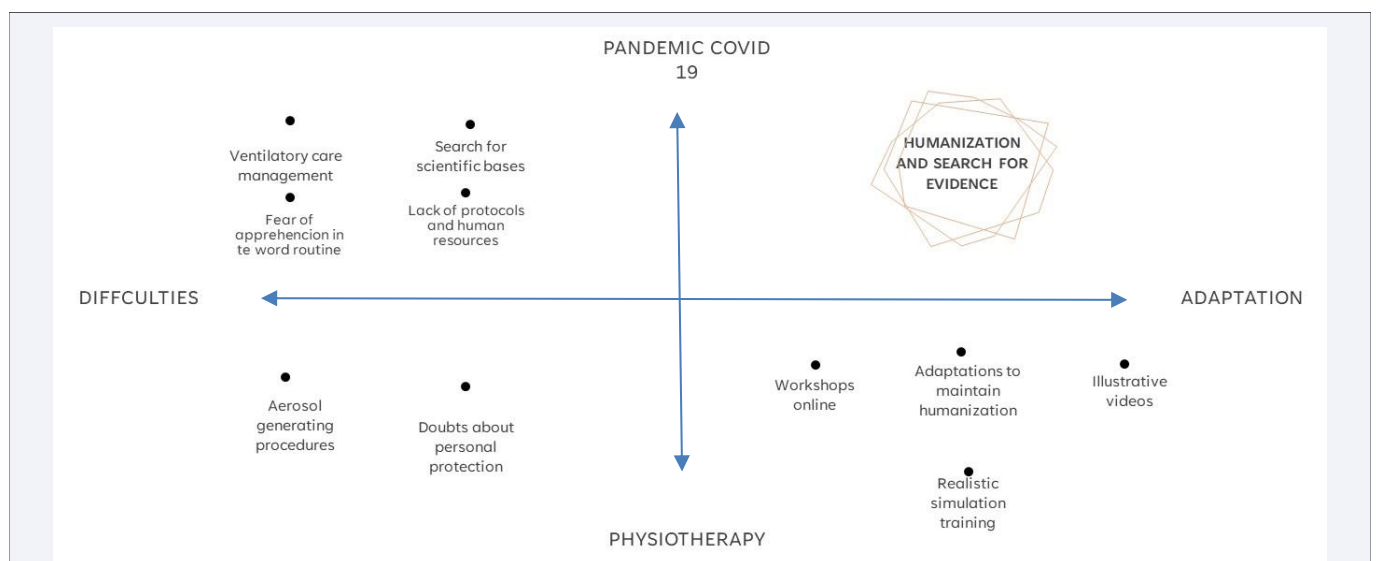


Figure 2 Adaptive axis chart on behavioral changes in the face of difficulties faced.

At the beginning of the pandemic, studies and expert opinions guided that; one should perform pre-oxygenation with a reservoir mask with the lowest possible air flow to maintain effective oxygenation; avoiding any assisted ventilation with the bag-valve-mask device, consequently avoiding greater dispersion of aerosols, however the experience of this experience in critical and life-threatening situations such as: pediatric intubation difficulties and cardiac arrest, instinctively the impulse was to ventilate the patient using the bag-valve-mask assuming the risks of contamination of the team; however ensuring the execution of the procedure in time to save life, dilemma these experienced recurrently [9].

The alternative facing the problem of pre oxygenation with assisted ventilation was the use of sedation as close as possible to the moment of the first intubation attempt, keeping the reservoir mask close to the patient's nostril and mouth, and if, in the absence of "drive" after sedation: inevitably assisted ventilation with the use of viral and bacteriological filters were used, in order to guarantee the patient's life and the team's protection [9].

Another experience in the neonatal and pediatric public were the recommendations of the regulatory bodies of the profession, such as "guidelines" and clinical protocols published in Brazil; of which indicated the use of inspiratory passive humidifier filters, and expiratory bacterial and viral filters connected to the mechanical ventilators; aiming to prevent aerosol dissemination and avoid infection in health professionals, however, in the neonatal and pediatric public the use of these filters must be well indicated and monitored and respect the size and filtration capacity of each passive humidifier, on the other hand, in practice, the great challenge was to find appropriate filters for each age group and tidal volume, which was again necessary adaptations such as we use active filter in the inspiratory branch and use of bacterial and viral filter in the expiratory branch, as the risk benefit for the patient and team could be maximized [9].

Several other situations occurred during this period; among those mentioned above: there was also the immediate need for training of the care team with management of mechanical ventilation, use of filters, manual resuscitator, among others in the management of the patient with COVID 19.

The regulation of patient flow upon admission, hiring of new temporary professionals, requiring training and the ability to deal emotionally with the occurrence of traumatic patient deaths and loss of family members. The alternative for this management were the multiprofessional trainings, with active learning methodologies based on problems and realistic simulation, which were given by professionals more updated in the publications that were happening worldwide, with practical trainings and illustrative videos.

In the beginning, the doubts regarding the use of personal protective equipment, and the scarcity and limitation of material for this purpose, generated internal conflicts. And the search for knowledge in order to avoid contamination in the care of sick people psychologically overloads those involved. Again being necessary several trainings for effective exchange of PPE (Personal Protective Equipment) and rationing of materials, because at the moment the world was in search of ensuring the

minimum for the assistance of these patients: medications, beds, equipment, human resources and EPIS.

Other challenges were associated with the attributions and responsibility of the physical therapist in the Brazilian pediatric intensive care unit, among them are: monitoring, oxygen therapy, invasive and non-invasive ventilation and administration of continuous positive airway pressure (CPAP), pronation and postural changes to improve oxygenation, physical reconditioning, initial and final functional assessment of the children admitted, use of respiratory techniques for bronchial hygiene and pulmonary re-expansion among others [19].

Reflecting on the experience currently lived; we highlight that among the impacts that most affected the professional experience; were the setbacks and uncertainties where care required adaptation, among them: the difficulty in maintaining humanization such as: the inability to remove the patient from the PICU bed and wander the hospital corridors, and the absence of the companion; among the uncertainties were: if the children really in our region will correspond to world expectations of low contamination rate of 5% [9].

About the back effects of humanization some studies have already shown that prolonged or repeated hospitalization processes generate impacts on children's lives, which may affect their growth and development and that during hospitalization, the child is submitted to a series of interventions, procedures and changes of routines that cause feelings of insecurity, pain, fear and isolation [5,15,17].

However, after the first months of internal suffering in the sector, with the child not being accompanied by his parents, it was possible to manage and adapt the parents' accompaniment in pediatric hospitalizations, following all the recommendations and institutional protocols and respecting the humanization policy in an adaptive way before that scenario of contamination by (COVID-19).

The Pediatric Intensive Care Unit, and its professionals from the physical therapy team had a breakthrough, being able to better manage fears and anxieties, feeling safer; because, we obtained temporally a larger number of published scientific evidence, vaccines for health professionals, training and experience in the management of confirmed or suspected cases.

After the first 7 months of the pandemic in Brazil we found the PICU unit with causes of respiratory admissions decreasing. In the beginning; all admitted patients were tested with the rapid tests and the cases with major clinical signs of viral respiratory infection were submitted to nasal swab for PCR testing. This result in the reporting period may demonstrate that the cases that worsen are mostly patients who already had a clinical history of comorbidities and frequent hospitalizations [20].

The problems faced by the professionals during the beginning of the pandemic were varied, and as for the emotional aspect in the face of the need to be resolute and proactive in combating a disease in the process of discovery, it may have had repercussions in the worsening of the quality of care and in the departures due to emotional disorders [21].

Near the 2-year anniversary of the pandemic, it was possible

to affirm that the “unknown” became “controlled”, because the team facing suspected and/or confirmed cases of COVID 19 was better prepared for the confrontation, the experience, courses, and training and continuing education meetings made the environment less tense.

CONCLUSION

The health professionals in their process of relearning how they would apply a safe and excellent assistance, were taken by a courage and determination, many times in double and exhausting journeys, overcame the difficulties imposed by a hitherto unknown disease, and did not measure efforts, not to mention the personal sufferings, such as loss of colleagues and family members in facing COVID 19.

The principles that govern the Theory of adaptation and its diverse and comprehensive forms of applicability were essential for a greater effectiveness of the intervention and also the importance of updated knowledge to ensure improvements in the team’s work process, in face of these changes that occurred in the pandemic environment.

We also observed that the profile of hospitalizations has been changing in this year of 2021, of which admissions for respiratory causes in seasonal periods are more frequent for the expected increase of this demand in the PICUs.

Future studies will be necessary to evaluate the post-pandemic stress in health professionals and the seasonality of respiratory viruses.

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