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SURF PRACTICE IN CHILDREN WITH AUTISTIC SPECTRUM DISORDER AT THE BANANINHA SURF SCHOOL - IMBITUBA – SC– BRAZIL

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ABSTRACT

INTRODUCTION: Autistic Spectrum Disorder (ASD) is a group of neuro developmental disorders that occur before the age of three. It is suitable for clinically relevant disturbance in emotional regulation, cognition, or any behavior of the individual. **OBJECTIVE:** to analyze the benefits of surfing in children with ASD by assessing their overall balance and motor skills before and after 5 surf lessons. **METHODS:** quasi-experimental and quality-quantitative research. The study was carried out from January to March 2020 at the Surf school of Bananinha - Imbituba - SC, a final sample was made up of 6 men, diagnosed with ASD, aged 2 to 11 years, using a Scale Motor Development Program adapted to assess overall balance and motor skills. **RESULTS:** there was no significant result, but there was an 18% increase in motor age in relation to global motor skills and a 15% increase in motor age related to balance after surfing lessons. **CONCLUSION:** The practice of surfing can be considered as a remarkable intervention tool for children with ASD, because in addition to being performed in a different environment from clinics, it favors the child's interaction. Based on the sample data, it can be said that Surf lessons can contribute to improving the balance and overall motor skills of children with ASD, however it is evident that the present sample is considered small as well as the number of lessons, so it does further research is needed to assess the effects of surfing as a resource for physiotherapeutic treatment in children with ASD.

Keywords: Autistic Spectrum Disorder. Surf. Equilibrium

1. INTRODUCTION

Autistic spectrum disorder (asd) is a group of neurodevelopmental disorders that occur before three years of age1. According to the statistical diagnostic manual for mental disorders - dsm-v, asd is characterized by a clinically relevant disturbance in the

emotional regulation, cognition, or behavior of an individual that portrays a dysfunction in the underlying biological, psychological or developmental processes to mental functioning2. Individuals with asd usually show common signs, such as a lack of desire to speak, anxiety, lack of balance, changes in motor skills as a result of lack of it, and difficulty in socializing, being essential to the diagnosis, as well as specific signs, such as the desire to align objects or the interest in another language, explaining the presence of large individual variations2. It is capable of generating conditions related to problems to provide and / or maintain attention, sensory disorders and limitations in balance and global motor skills3,4.

Clinically, the individual's mental and physical conditions are affected, increasing the demand for care and, consequently, the level of dependence of parents and / or caregivers4,5. Even if there is no known cure, in the case of ASD, a diagnosis together with an early intervention cooperate to decrease the existence of chronification, expand the possibilities of treatment and minimize the multiple symptoms6,7.

For the diagnosis of ASD, a clinical decision is necessary, with difficulty since there is a huge variability in the form and strength of expression of symptoms8. Following the diagnosis of ASD, the family should look for possibilities to improve quality of life, sensory, motor and communication aspects9.

The basis of treatment involves behavior change techniques, language / communication therapies and educational programs9. It is necessary to have a multidisciplinary team involving: speech therapists, psychologists, physical education professionals, occupational therapists and the physical therapist6,7. Physiotherapy is considered of paramount importance in the treatment of motor dysfunctions, mainly in postural control, deficits in gait, motor coordination and balance10.

Sports and physical activities provide great opportunities for knowledge and learning for individuals with ASD, as well as self-esteem and pleasure, providing a better quality of life. It allows an evolution in physical performance, improves communication and socialization, increases knowledge about your body's abilities and the relationship with the environment11. It is believed that Surfing can bring benefits to individuals with ASD, stimulating different sensory systems, leading to the stimulation and learning of functional activities, as well as in psychological development, improving social integration, promoting the development of balance and general motor coordination11 -13.

2. OBJECTIVES

The general objective of the present work was to analyze the benefits of Surfing in children with ASD and as specific objectives: to evaluate the balance and the global motricity of these children before and after 5 Surf lessons through the adapted motor development scale of Francisco Rosa Neto, in Surf school of Bananinha - Imbituba - SC.

3. METHODS

It is characterized by a quasi-experimental research, in which it analyzed qualitatively and quantitatively the data obtained. The study was developed at the Surf School of Bananinha in the city of Imbituba - SC, from January to March 2020. The final sample was composed of 6 individuals diagnosed with ASD, who met the inclusion criteria.

Male children with a diagnosis of ASD were included, aged between 2 and 11 years old, who

were surfing at Bananinha school, which their parents or guardians agreed to participate in the research by signing the Free and Informed Consent Term (ICF). , Free and Informed Consent Term (TALE), and that did not fit any of the exclusion criteria: being less than 2 years old and more than 11 years old, missing a Surf lesson during the research and individuals who did not bring the ICF and TALE signed.

The research was approved by the Research Ethics Committee (CEP) of the University of the South of Santa Catarina (UNISUL) with opinion number: 1,928,809 (Annex A). Throughout the study, information was kept confidential and anonymous, in accordance with Resolution No. 466/2012 of the National Health Council. All parents and guardians of the study participants previously signed the informed consent form and the participants signed the TALE, after being informed about the procedures carried out in the study. The evaluation of the participants in Imbituba was carried out in front of the life guard post with the help of the parents, using the anamnesis form composed of personal data; family data; main complaint; history of the current disease; history of past illness. The Portuguese version of the CARS scale was also used. The scale was answered by parents, which assesses the behavior of children in 14 domains, and contains one more item with the general category of ASD impression, with a total of 15 items13. These include: personal relationships; imitation; emotional response; body use; use of objects; response to changes; visual response; auditory response; response and use of taste; smell and touch; fear or anxiety; verbal communication; non verbal comunication; activity level; level and consistency of intellectual response and general impressions. The scores for each domain range from one (within normal limits) to four (severe symptoms), the total score ranges from 15 to 60, being considered 15-30 without autism, 30-36 mild-moderate autism, 36-60 severe autism13.The Motor Development Scale (EDM) [1] adapted during the intervention period was used. EDM evaluating the motor development of children between 2 and 11 years of age, through tests of skills formed only by global motor skills, and balance14,15. After the evaluation, the participants were subjected to 5 surf lessons, with a frequency of 1 time per week, lasting 60 minutes, the parents or guardians were in charge of taking the children to the place and remaining present throughout the surf lesson.

For the intervention period, the board that used between 9/16 '(which unit is this?) To 11' was used. The subjects participating in the study were equipped with lycra (thermal shirt) and none of them needed a vest. The other equipment used on the board is described in table 1.

1 - Equipment used during the Surf lesson.

Paraffin	Piece placed on the board, used to give grip and prevent the surfer from slipping off the board.
Lash	Rope used to attach the surfboard to the surfer's body (placed on the surfer's ankle)
Fins	Positioned at the bottom of the board, it is important for operation, giving stability and speed to surfers.

The Surf lessons were divided into 5 stages, where you only advanced to the next one after being able to complete the previous stage, being these:

- First stage (prayer): a circle was held hand in hand with the children (some did not hold hands) parents or guardians, volunteers and the teacher Bananinha where he exchanged a few words with the children and started a prayer (Our Father) .
- Second Stage (stretching): the lower and upper limbs stretches were still started with the circle, and some were performed in pairs, father and son or two children.
- Third Stage (simulation in the sand): at that time the boards were already in the sand next to each other and then Bananinha started a simulation of the Surf, paddling, climbing, positioning the feet and flexing the knees. Usually three children at a time, they all wait for their turn to paddle and get on the board. It is at this stage that they learn to position their feet, find out if they are: Regular, which is when the surfer uses his left foot in front or Goof when he uses his right foot in front. They also know two more words to Backside, when the surfer is coasting to the wave and Frontside, facing it.
- Fourth Stage (entering the sea): started entering the sea with the child sitting or lying on the board, with 2 volunteers per child, right in the first waves, where it was shallow for them for the purpose of adaptation, placing the hand on the water, feeling the vibrations of the wave and trying to keep the balance.
- Fifth Stage (standing): after a few minutes it was time to "catch the wave", with the help of the volunteers and Bananinha, the children were positioned facing the sand, waiting for a wave to come, in this stage the big goal is stand on the board.

Each child had their difficulties, some were able to stand on the first wave, others remained standing only in the last classes. At the end, when classes ended, the children communicated with Bananinha thanking and looking forward to the next class. It is worth mentioning that due to the Covid-19 pandemic, classes were closed earlier, which is also the reason for having totaled only 5 classes.

The data obtained were inserted into a database, Microsof Excel®. Quantitative variables were described by means and standard deviations.

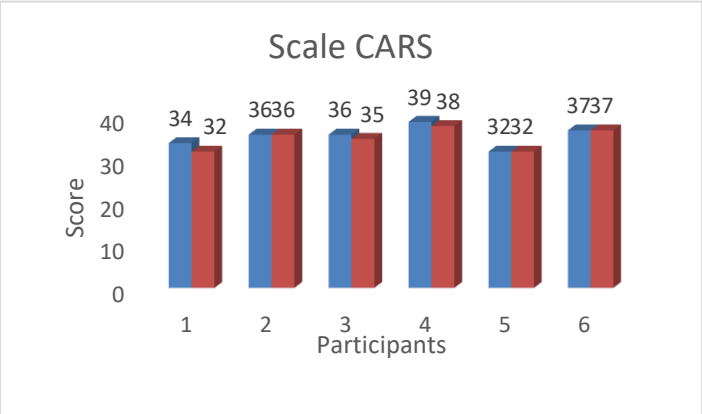
Student's t test ($p < 0.05$) was used to analyze the variables. The level of significance was 95%.

2. RESULTS

Initially, 10 children were selected, of these, 4 were excluded due to three being absent from the reevaluation and one not attending classes three times in a row (including the reevaluation). The sample had a mean age of 102 ± 2.217 months, with no difference in sex as they were all male. When evaluated by the CARS scale, the participants had an average of 35.6 ± 5.418 points in the assessment of global motor skills and an average of 58 ± 25.3 months, and in relation to balance, they had an average of 59 ± 9.0 months.

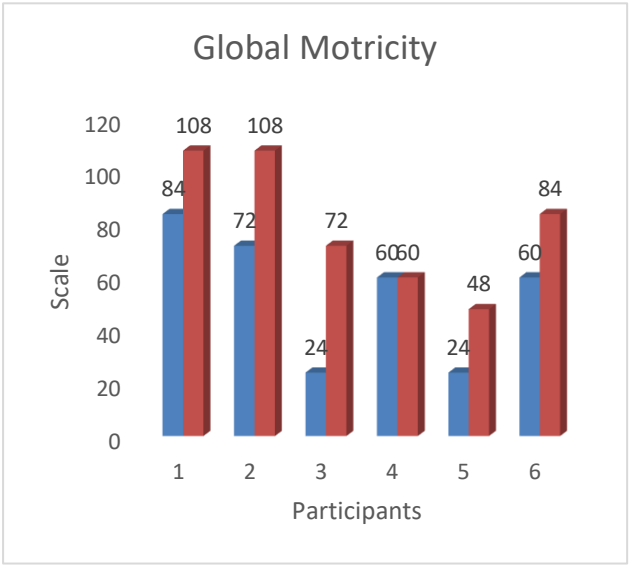
Graph 1 shows the result of the CARS scale in the evaluation and reevaluation of the study participants.

Graph 1: CARS scale score - evaluation and reassessment



reevaluation, fifth participant remained in 32 and, sixth participant with the same score of 37 in the evaluation and reevaluation. Revaluation. Regarding the assessment and reevaluation of global motor skills assessed by the adapted Motor Development Scale of Rosa Neto, the results are shown in Graph 2.

In the score of the CARS scale, the child when presenting a total score between 15-30 is classified as without autistic characteristic, 30-36



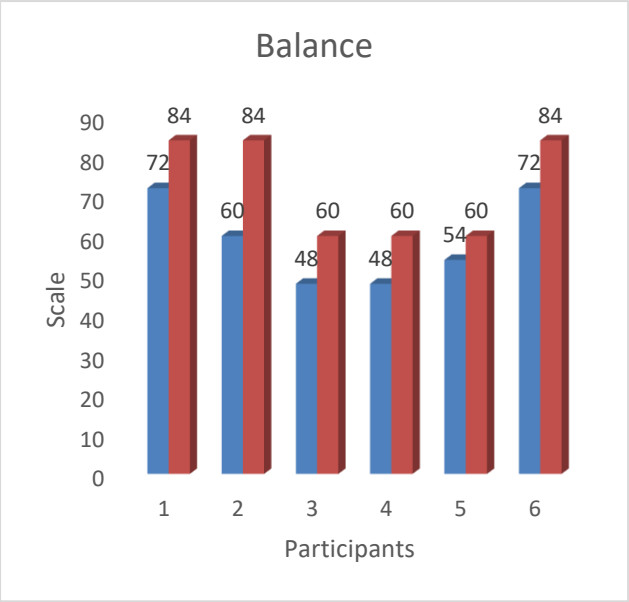
mild-moderate autism, and 36-60 severe autism14. We can observe a prevalence of ASD in its most severe degree within the sample, in participants 2, 4 and 6, with participant one having a score of 34 in the evaluation and 32 in the reevaluation, participant two remained the score in 36 , participant three went from 36 to 35, participant four scored 39 in the evaluation and 38 in the

Graph 2: Assessment and reassessment of global motor skills expressed by months.

There was an increase of 18% in the motor age of the global motor skills of the practitioners before and after the Surf lessons, although it was not significant ($p = 0.0998$). It is possible to observe that participants 1, 2, 3, 5, 6 had an increase in global motor skills, but participant 4 remained the same.

Graph 3 shows the results in relation to balance during assessment and reevaluation.

Graph 3: Evaluation and reevaluation of the balance expressed by months.



There was no statistical difference before and after Surf lessons in the motor age of the participants in relation to balance (p = 0.0929), but there was a 15% increase in the motor age of the practitioners after the Surf lessons. Interestingly, surf instructors and parents reported several positive results. They observed an increase in global balance and motor skills, in addition to self-confidence, gains in social development and decreased anxiety in children, some parents reported a decrease in the use of medication after surfing lessons, other improvements included greater verbalization, enthusiasm and motivation about the physical activity, greater participation and better performance in other activities and improvements in surfing skills.

4. DISCUSSION

In the present study, the global balance and motor skills were assessed using the adapted motor development scale, and the CARS scale, both before and after surfing lessons. The function was to analyze the benefits of surfing, assessing whether the sport can contribute to the motor development of children with ASD. The findings of the present study found that there was a positive increase in overall balance and motor skills among children who practice surfing. In this study, 6 children aged 11 years or less were evaluated, with the lowest age found being 6 years, an age range similar to that used in the study by Clapham et al18, which was a case study with an individual, conducted for the education program. 8-week summer surf held every year for six years as a therapeutic recreation with a similar objective to ours, to evaluate the effectiveness of a Surf program. Physiological and behavioral variables were evaluated, such as aerobic capacity, muscle strength and endurance, range of motion and balance of a child with ASD. The participant demonstrated improvements each year of the Surf program, indicating that the positive results obtained after each year were often lost when the subject started the Surf Therapy program the following year. The study also suggests future research to identify practical maintenance activities that allow the retention of benefits to children with ASD obtained in summer Surf therapy programs, with this, the results prove that Surf has shown an improvement in balance, similar to ours study whose improvement was also observed.

Despite the difference between the topics evaluated and the length of the Surf program being greater between Clapham et al18 and the

present study in terms of behavior evaluated, the results agree that Surf can improve balance and behavior in general in these children. They also support the results of Surf studies with the ASD population, suggesting that there is an important significance in the interaction between man and sea that can affect positive changes in irritability, hyperactivity, social and communication behaviors in this population19.

Pereira et al20 conducted a study that aimed to analyze the sports motor performance of children and adolescents with ASD. The study was composed of 6 individuals aged between 8 and 13 years. It used displacement speed and balance tests with observations from a period of 10 months of project classes. All subjects presented a result considered “weak” in the tests, concluding that physical activity is an important mechanism for motor, cognitive and social development of ASD patients.

In agreement with the study by Pereira et al20 that physical activity is important, especially for the motor, cognitive and social development of individuals with ASD, however it is necessary to propose sensorimotor activities, exercises that stimulate jumping, jumping and running so that the children can experience their tonic condition in the body, in the relationship with others in the world, where these experiences will progress motor development, increase strength, balance, stimulating fine and gross motor skills and evolve in cognitive potential21.

In the study by Silva et al22, the objective was to demonstrate the importance and benefits arising from the practice of physical activities aimed at individuals with ASD. The research methodology covered was bibliographic with a review of concepts, as well as approaches and objectives through the qualitative method, data collection by free scientific articles such as Scielo, Lilacs database. The results obtained with the research agree with our research, stating that the practice of activities in addition to the benefits in the physical part, generate greater aerobic capacity, gain in amplitude, improves the general development of individuals with ASD. Activities provide a better quality of life for ASD patients, improving social life and including them with the environment, enabling greater interaction with people22.

In children with ASD, several conditions can manifest themselves as characteristics, including delayed motor development, lack of communication, difficulty in social interaction, among others. Physiotherapy helps as a treatment tool where the skills are stimulated and the uniqueness of each patient is studied in a particular and comprehensive way, aiming at the patient therapist interaction through stimuli, working in order to provide a better development for these children23, therefore, the individual's interaction with ASD with the Surf and the sea allows for a different treatment, leaving something monotonous and becoming more fun for the child24.

One of the parameters evaluated was the CARS scale, which classifies individuals into: no autistic characteristics, mild or moderate autism and severe autism. In the case study of Ferreira et al

25 involving 5 children and adolescents aged 3 to 15 years of both sexes, diagnosed with the spectrum, the CARS instrument was also used. The children received individual physiotherapeutic treatments, where several recreational activities were carried out, among them, activities similar to the motor development scale that was used in our study, such as standing on one foot, jumping, standing on tiptoes. The results could show that the majority of children were classified as having severe autism, similar to our study that the characteristic of severe ASD prevailed. Associated with this, it was observed that children with not-so-satisfactory independence were the same as those classified with severe autism by CARS, which indicates that the severity of autism can be a direct influence on the independence of these children25.

Armitano et al 26 aimed to evaluate the effectiveness of an eight-week surfing intervention for 16 children with disabilities, including Down syndrome, ASD and delayed motor development, with 7 of these children with ASD aged between 4 and 14 years. The results showed an improvement in upper body strength (right: $p = 0.024$, left: $p = 0.022$), central strength ($p = 0.002$), balance ($p = 0.027$) and cardiorespiratory resistance ($p = 0.013$). This research was the first of its kind, illustrating the feasibility and effectiveness of a surfing intervention in improving the physical fitness and balance of disabled children.

Our research agrees with that of Armitano et al26 in improving balance after the Surf intervention and diverging in the deficiencies, which included Down syndrome and delayed motor development, and also differing in the number of classes. In addition, they agree with the present study that the results show an improvement in balance after surfing.

The limiting factors found were the scarcity of studies related to the population with ASD and Surf, thus having few articles for a more detailed analysis. The amount of surf lessons had to be reduced due to the Covid-19 pandemic becoming another limiting factor. For future research in the area, it is necessary to have more surfing time with a larger sample.

FINAL CONSIDERATIONS

Surfing can be considered a notable intervention instrument for children with ASD, because in addition to being carried out in a differentiated clinic environment, with games and playful activities favoring social interaction and with the environment, sand and sea, producing stimulation of motor skills, such as squatting, lifting and jumping.

The effect promoted by Surf in children with ASD was due to the interaction between the child and contact with the sea. From the first contact, the preliminary care, until the act of climbing on the board and finally trying to stand on it, there is an interaction, which can develop self-confidence, self-esteem and new forms of socialization.

Based on the data in this sample, it can be said that Surf lessons can contribute to the improvement of balance and overall motor skills of children with ASD, however it is evident that

the present sample is considered small as well as the number of lessons in a short time. . However, it is necessary to conduct further studies with a sample and longer time to assess the effects of surfing as a resource for physical therapy treatment in children with ASD.

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ATTACHMENT

ATTACHMENT A - OPINION CONSTITUTED BY THE CEP

UNIVERSIDADE DO SUL DE SANTA CATARINA - UNISUL

PARECER CONSUBSTANCIADO DO CEP

DADOS DO PROJETO DE PESQUISA

Título da Pesquisa: A PRÁTICA DO SURF EM CRIANÇAS COM TRANSTORNO DO ESPECTRO AUTISTA NA ESCOLA DE SURF DO BANANINHA ¿ IMBITUBA - SC

Pesquisador: Fabiana Durante de Medeiros

Área Temática:

Versão: 2

CAAE: 24419119.5.0000.5369

Instituição Proponente: Universidade do Sul de Santa Catarina - UNISUL

Patrocinador Principal: Financiamento Próprio

DADOS DO PARECER

Número do Parecer: 3.742.317

Apresentação do Projeto:

O presente projeto de pesquisa trata de um trabalho de conclusão de curso de Fisioterapia, tendo como pesquisadora responsável: Fabiana Durante de Medeiros, cujo objetivo é avaliar os benefícios do surf em crianças com espectro autista. O Transtorno do Espectro Autista (TEA) faz parte de um grupo de distúrbios do desenvolvimento neurológico que ocorre antes dos três anos de idade, normalmente apresentam sinais comuns, como por exemplo, falta de equilíbrio, alterações nas habilidades motoras e dificuldade para se socializar. Objetivo geral: analisar os benefícios do Surf em crianças com TEA. Métodos: Trata-se de um estudo quase experimental, de abordagem quantitativa e nível exploratório. Serão selecionados 100% das crianças do sexo masculino com TEA que tenham entre 3 e 11 anos, praticantes de Surf na escola do Bananinha – Imbituba – SC, onde para participar, os pais irão assinar o TCLE e as crianças o TALE. O estudo irá avaliar o equilíbrio e motricidade global antes e após as aulas de Surf através da EDM, totalizando 10 aulas de Surf com duração de 1 hora cada.

Análise dos dados: Os dados serão expressos em média e desvio padrão. Será utilizado o teste de Wilcoxon para avaliação dos parâmetros antes e após as aulas de Surf. Para todas as análises será considerado o valor de significância de 95%, com $p<0,05$. As análises estatísticas e os gráficos serão realizados no software GraphPad Prism® versão 8.1 Resultados esperados: Espera-se desenvolver conhecimento sobre a influência do Surf em relação as crianças com TEA, onde o Surf possa contribuir para um aumento do equilíbrio, melhorando a motricidade global e possibilitando

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uma maior integração social.

Objetivo da Pesquisa:

Objetivo Primário:

Analisar os benefícios do Surf em crianças com TEA.

Objetivo Secundário:

Avaliar o equilíbrio de crianças com TEA antes e após a prática de Surf.

Avaliar a motricidade global de crianças com TEA antes e após a prática de Surf.

Avaliação dos Riscos e Benefícios:

Riscos:

O presente estudo apresenta como risco mínimo cair da prancha, vale ressaltar que as crianças estarão com seus instrutores da escola de Surf do Bananinha, com colete salva vidas e caso aconteça de caírem da prancha, existe um posto de guardas vidas em frente ao local juntamente com uma equipe preparada para prestar socorros. Caso aconteça alguma emergência o voluntário será atendido pela equipe de guarda vidas e se necessário acompanhado até o hospital São Camilo em Imbituba-SC para o atendimento. Além disso, o mesmo poderá se recusar a continuar no estudo, ou retirar seu consentimento a qualquer momento, sem precisar justificar, e se desejar sair da pesquisa, não sofrerá qualquer prejuízo à assistência.

Benefícios:

Como resultados e benefícios espera-se que o Surf traga uma melhora no equilíbrio, na motricidade global e na integração social do indivíduo, contribuindo para um novo estudo com crianças com TEA e Surf.

Comentários e Considerações sobre a Pesquisa:

A pesquisa apresenta os elementos necessários ao projeto de pesquisa de forma clara e coerente. Apresentando também a carta de resposta das pendências anteriormente mencionadas.

Considerações sobre os Termos de apresentação obrigatória:

Os Ajustes pendências foram realizados estando em consonância com as resoluções 466/12 e 510/16.

Conclusões ou Pendências e Lista de Inadequações:

O projeto encontra-se sem pendências.

Considerações Finais a critério do CEP:

Protocolo de pesquisa em consonância com a Resolução 466/12 e/ou 510/16 do Conselho

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Nacional de Saúde.

Este parecer foi elaborado baseado nos documentos abaixo relacionados:

Tipo Documento	Arquivo	Postagem	Autor	Situação
Informações Básicas do Projeto	PB_INFORMAÇÕES_BÁSICAS_DO_PROJETO_1459414.pdf	02/12/2019 12:33:41		Aceito
Projeto Detalhado / Brochura Investigador	TCC_pdf.pdf	02/12/2019 12:29:17	LARA FERNANDES DA SILVA	Aceito
TCLE / Termos de Assentimento / Justificativa de Ausência	TCLE_pdf.pdf	02/12/2019 12:24:26	LARA FERNANDES DA SILVA	Aceito
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TCLE / Termos de Assentimento / Justificativa de Ausência	termos_.pdf	25/10/2019 10:33:38	LARA FERNANDES DA SILVA	Aceito

Situação do Parecer:
Aprovado

Necessita Apreciação da CONEP:
Não

PALHOCA, 03 de Dezembro de 2019

Assinado por:
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