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PHYSICAL EXERCISE PROGRAM IN CEREBRAL PALSY FOR POSTPARTUM PATIENTS

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ABSTRACT

Most of the family members of people with Cerebral Palsy (CP) are those who function as informal caregivers. On certain occasions, their work affects their quality of life and their health, and can trigger lumbar and cervical pain. Studies carried out in several countries show that they are a highly vulnerable population, with poor coping strategies that favor their adaptive process. The present study aims to determine the effects of physical exercise on neck pain present in caregivers of people with CP. It is a quasi-experimental quantitative research, with a pretest-post-test design with a control group, with a non-probabilistic sample due to accessibility considering the characteristics of the participants for the study. The research carried out the analysis of the functional effects on the cervical and emotional spine of the implementation of a physical exercise program in caregivers of people with CP. The intervention with a physical exercise program for 16 weeks in an experimental group of 12 informal CP caregivers for 19.83 ± 1.2 years improved caregiver burden, emotional health and neck pain. In contrast, the control group after 16 weeks worsened anxiety. The results of the present study collaborate as a non-pharmaceutical treatment for anxiety and neck pain, being the practice of physical exercise for 16 weeks a good option to alleviate the symptoms of Caregiver Overload Syndrome.

KEYWORDS: Caregivers, Cerebral Palsy, Physical Exercise.

1. INTRODUCTION

Cerebral Palsy (CP) is a physical disability that produces alterations in mobility and development, as well as others in sensation, perception, cognition, communication and behavior (1) . The family of the subjects with CP tries to improve the quality of life of the people in their care, showing a correlation between the degree of motor involvement and the decrease in quality of life in the pediatric and adolescent population with CP . This disability affects both the quality of life of the people who have it, as well as that of their caregivers (2) . People in charge of a relative with CP usually have health problems associated with the exercise of this work. Among the main illnesses are: stress, headache, sleep disturbances, anxiety and neck pain(3) .

There is evidence that the use of supervised exercise, performed three times a week with moderate intensity for a minimum of eight weeks, has become an alternative treatment to medication in the management of depression and spinal pain (4– 6). Exercise increases blood flow, vascular density, during the practice of it the nervous system increases the levels of neurotransmitters such as: endorphins, norepinephrine, serotonin, reducing anxiety, pain and improving mood and sensation of well-being (7.8). These benefits can also be seen reflected in caregivers of people with chronic neurological diseases, in different studies on the practice of physical exercise have shown positive effects mainly in reducing the burden of the caregiver (9,10).

The physical and emotional health of the caregiver is important, and currently there is little scientific evidence on treatments, prevention and promotion measures that help improve the quality of life of this group of people. This was the main motivation for the conducting this research, therefore, the objective of this study is to determine the effects of physical exercise in caregivers of people with CP.

2 METHODS

2.1 Design

The present study is a quasi-experimental quantitative investigation, with a pretest-post-test design with a control group, with a non-probabilistic sampling for accessibility considering the inclusion characteristics that the participants had to meet.

In the research, the analysis of the effects of the implementation of a physical exercise program in caregivers of people with CP in 2019 was carried out.

Due to the Covid 19 pandemic of more than two years, it was decided to carry out a third evaluation to assess the impact of confinement on the study sample.

2.2. Participants

A total of 24 women with a mean age of 48.25 ± 1.29 years participated, caregivers of a relative with CP, who presented the Caregiver Overload Syndrome.

The sample was divided into two groups: a so-called intervention group, which carried out a 16-week exercise program with a frequency of 3 times a week, and a control group whose participants followed their usual lives.

The inclusion criteria were: being the caregiver of a relative with CP, for a period between 18 and 25 years, having the Caregiver Overload Syndrome, valued with a score greater than 46 in the Za-rit test, who had no problems that prevented them from practicing physical activity and that they agreed to participate freely and voluntarily in the research. The exclusion criteria were being the caregiver of a family member with another dependent disease, presenting cardiovascular risk and/or pre-existing heart disease or some other pathology that prevented regular exercise.

2.3. Procedure

The variables of: family functionality with the APGAR test, caregiver burden with the Zarit test, emotional well-being with the GHQ 28 questionnaire and cervical functionality with the Cervical Disability Index test were investigated.

The planning of the exercise program in caregivers of people with CP who presented the Caregiver Overload Syndrome was implemented in a period of 16 weeks, 3 days a week (with one day off), for 60 minutes. In the first 4 weeks of the physical activity program, 30 minutes of low-intensity aerobic exercise (30-40% FCR) and 15-minute muscle training by lower and upper limb muscle groups at 60% 1RM were performed, performing 3 series of 15 repetitions with 15 seconds of rest between each series. From week 5 to week 16, the intensity of aerobic exercise was increased to moderate (40-60% FCR) and the time to 40 minutes, as well as muscle training to 70% 1RM, performing 4 series of 15 repetitions with 10 seconds of rest between each series.

2.4 Statistical Analysis

Data are shown as mean ± standard deviation. The normality of the variables was verified with the SHAPIRO-WILK test. To analyze the influence of the intervention program on the study variables, a two-factor ANOVA was performed (Group * pre-post).

The level of significance was established at p <0.05 in all cases. All the calculations were made with the SPSS version 22 program.

2.5. Ethical Considerations

All families received information on the objectives and characteristics of the study and gave their verbal and written informed consent by the participant. This work was designed following the deontological norms recognized by the Declaration of Helsinki, complying with the recommendations of the Good Clinical Practice of the Ecuadorian Ministry of Public Health and the current Ecuadorian regulations that regulate research in human beings and received the appraisal. positive feedback from the Ethics Committee.

3. RESULTS

Table 1: Caregiver Burden, Emotional Well-Being, Neck Pain, Low Back Pain Before and After The Intervention, 2019.

		GE (N=12)	Intragroup Difference *P*	GC (N=12)	Intragroup Difference *P*	Intergroup Difference *P*
Caregiver Burden	before	61,6 ± 3,11	0,00*	64,58 ± 4,56	0,08	0,00*
	after	53,6 ± 3,72		65,25 ± 4,15		
Somatic symptoms	before	5,83 ± 0,71	0,00*	5,5 ± 0,52	0,08	0,015*
	after	4,9 ± 0,79		5,75 ± 0,75		
Anxiety	before	6,25 ± 0,62	0,00*	5,75 ± 0,62	0,01*	0,00*
	after	4 ± 0,6		6,16 ± 0,83		
Social dysfunction	before	6,33 ± 0,49	0,00*	6,16 ± 0,57	0,03*	0,00*
	after	5,08 ± 0,66		6,5 ± 0,67		
Depression	before	5,91 ± 0,66	0,00*	5,41 ± 0,99	0,08	0,012*
	after	4,08 ± 0,79		5,16 ± 1,11		
Cervical functionality	before	58,79 ± 2,22	0,00*	56,83 ± 3,08	0,08	0,012*
	after	44,08 ± 1,79		57,16 ± 2,41		
Lumbar functionality	before	56,25 ± 1,22	0,00*	60,13 ± 3,08	0,09	0,000*
	after	42,18 ± 1,56		60,26 ± 3,81		

Note: GE= Experimental Group; GC= Control Group; P= statistical significance. *Indicates statistically significant intragroup difference with significance level P<0.05.

A significant change was shown at the end of the intervention in the intervention group compared to the control group in all study variables (care burden: P=0.00; somatic symptoms: caregiver burden, emotional health, and cervical functionality On the contrary, the control group worsened anxiety after 16 weeks.

The results of this study support the fact that supervised physical exercise practice for 16 weeks is a good option to alleviate the symptoms of Caregiver Burden Syndrome, taking into account that before the intervention the overload was 61.6 ± 3 .11, but at the end it decreased to 53.6 ± 3.72.

The post-intervention data in the two groups vary between groups. In the intervention group, the variables of caregiver burden and emotional well-being decreased in a statistically significant way (P<0.05), on the contrary, in the group. control group these variables increased. Anxiety in the control group increased from 5.75 ± 0.62 to 6.16 ± 0.83 and social dysfunction worsened from 6.16 ± 0.57 to 6.5 ±

0.67.

The burden of the caregivers in the Zarit test was significantly reduced in the group that followed the exercise program P<0.05, on the other hand, in the control group there was no statistically significant change (P=0, 08).

When analyzing emotional well-being, the subscales that presented the greatest reduction after the intervention with the physical activity program were anxiety and depression (P<0.05), while the control group increased anxiety statistically significantly. (P=0.01) and social dysfunction (P=0.03).

The experimental group reduced neck pain after the intervention with the practice of physical exercise (P=0.01) unlike the control group that did not present any statistically significant change (P=0.08).

The experimental group reduced low back pain after the intervention with the practice of physical exercise (P=0.00) unlike the control group that did not present any statistically significant change (P=0.09).

Table 2: Caregiver Burden, Emotional Well-Being and Neck Pain Before and After Confinement, 2021.

		GE (N=12)	Intragroup Difference *P*	GC (N=12)	Intragroup Difference *P*	Intergroup Difference *P*
Caregiver Burden	2019	53,6 ± 3,72	0,00*	65,25 ± 4,15	0,00*	0,00*
	2021	68,6 ± 2,13		77,15 ± 5,12		
Somatic symptoms	2019	4,9 ± 0,79	0,00*	5,75 ± 0,75	0,00*	0,387
	2021	6,8± 0,12		6,8± 0,11		
Anxiety	2019	4 ± 0,6	0,00*	6,16 ± 0,83	0,01*	0,264
	2021	6,5± 0,31		6,5± 0,21		
Social dysfunction	2019	5,08± 0,66	0,00*	6,5 ± 0,67	0,00*	0,064
	2021	6,6± 0,31		6,9± 0,01		
Depression	2019	4,08 ± 0,79	0,00*	5,16 ± 1,11	0,00*	0,128
	2021	6,4± 0,22		6,5± 0,22		
Cervical functionality	2019	44,08 ± 1,79	0,00*	57,16 ± 2,41	0,00*	0,00*
	2021	62,32 ± 2,56		68,32 ± 2,36		
Lumbar functionality	2019	42,18 ± 1,56	0,00*	60,26 ± 3,81	0,00*	0,072
	2021	69,76 ± 3,23		70,76 ± 3,23		

Note: GE= Experimental Group; GC= Control Group; P= statistical significance. *Indicates statistically significant intragroup difference with significance level P<0.05.

When carrying out the follow-up facing two years of pandemic and moderate confinement, without receiving any type of intervention due to capacity limitations and access to computer communication technology, the caregivers of the study sample of the experimental groups mental and control worsened their quality of life and cervical and lumbar functionality statistically significantly (P=0.00).

In the experimental group in 2019, the caregiver burden after the implementation of the exercise program was 53.6 ± 3.72, and post-confinement increased to 68.6 ± 2.13 in 2021. And in the group control increased to 77.15 ± 5.12.

Social dysfunction worsened more in the control group with confinement to a mean of 6.9 ± 0.01 and in the experimental group 6.6 ± 0.31.

The cervical disability in the experimental group increased considerably from 44.08 ± 1.79 to 62.32 ± 2.56, while there was an intergroup difference (P=0.00).

4. DISCUSSION

Good results were obtained in 2019, the physical exercise program applied for 16 weeks to the experimental group of caregivers from the Roldós community located northwest of Quito with the Caregiver Overload Syndrome produced positive effects in reducing the caregiver burden, somatic symptoms, anxiety, social dysfunction, and depression, which, unlike the control group, increased anxiety and social dysfunction

The results of this research agree with studies carried out on caregivers of people with chronic diseases, that the practice of physical exercise causes the reduction of symptoms of depression, anxiety and caregiver overload(19,20). Physical exercise improves the regulation of the cardiovascular and respiratory system, affecting the nervous system, which increases the levels of neurotransmitters such as: endorphins, noradrenaline, serotonin, reducing anxiety, pain and improving mood and feeling.

satisfaction of well-being (21,22).

But these good results were lost when facing a moderate confinement for more than two years, in which accessibility to health only prioritized covid 19 and university community health projects were suspended due to lack of attendance at classes.

It should be noted as a strength of the study, the participants completed the planned 16 weeks and the feasibility of follow-up. This research promotes future lines of research such as training informal caregivers for the prevention of their physical and emotional health.

5. CONCLUSIONS

In caregivers of people with chronic diseases, such as CP, they often present exhaustion, physical and psychological exhaustion due to an intense dedication to care. This situation causes a series of physical, psychological and emotional symptoms.

The intervention of a 16-week physical exercise program for an experimental group of 12 informal CP caregivers improved the caregiver's burden, emotional health, and cervical functionality. In contrast, the control group after 16 weeks worsened emotional health in terms of anxiety and social dysfunction.

This study is of great contribution to the treatment of neck pain and anxiety with physical exercise for 16 weeks if good results are observed in the research sample.

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