

شبكة المعلومات الجامعية







شبكة المعلومات الجامعية التوثيق الالكتروني والميكروفيلم



شبكة المعلومات الجامعية

### جامعة عين شمس

التوثيق الالكتروني والميكروفيلم

#### قسم

نقسم بالله العظيم أن المادة التي تم توثيقها وتسجيلها على هذه الأفلام قد أعدت دون أية تغيرات



يجب أن

تحفظ هذه الأفلام بعيدا عن الغبار في درجة حرارة من ١٥-٥٠ مئوية ورطوبة نسبية من ٢٠-٠٠% To be Kept away from Dust in Dry Cool place of 15-25- c and relative humidity 20-40%



## بعض الوثائـــق الإصليــة تالفــة



# بالرسالة صفحات لم ترد بالإصل

# Utilization of Spider Cage for Dynamic Balance Enhancement in Spastic Hemiparetic Cerebral Palsy Children

12 V P

615,82

A Thesis
Submitted in Partial Fulfillment for the Requirements of
Master Degree in Physical Therapy

By
TAMER EMAM EL-NEGMY

B.Sc. in Physical Therapy Cairo University

Faculty of Physical Therapy Cairo University 2007

#### **Supervisors**

#### Prof.Dr. Elham El Sayed Salem

Professor of the Department of Growth and Development Disorders in Pediatrics
And Its Surgery,
Faculty of Physical Therapy
Cairo University

Elham El Sayed Salam

#### Dr. Manal Salah El-Din Abd El wahab

Lecturer in the Department of Growth and Development Disorders in Pediatrics
And Its Surgery,
Faculty of Physical Therapy
Cairo University

#### Dr. Nagi Sobhi Nassif

Lecturer in the Department of Biomechanics Faculty of Physical Therapy Cairo University

## بالمالح المال

# المريد العالم الكوالية المريد العالم المريد المريد

صدق الله العظيم سورة البقرة الآية (٣٢)

#### **DEDICATION**

To my sweet father, mother and to my only beloved wife

#### Acknowledgement

It is a real pleasure to thank my supervisors Prof. Elham Elsayed Salem, professor Physical Therapy Department for growth and developmental disorders and surgery in paediatrics, Dr. Manal Salal El-Din Abd El-Wahab, lectures at the same department and Dr. Nagi Sobhi Nassif, biomechanics department, faculty of physical therapy Cairo university for their great help, support and encouragement during conducting the theoretical and practical part of this thesis.

Also, I would like to thank the Families of C.P. children willeningly participated in this study.

Last and not least I offer my sincere thanks to my family who support me all the way to finish this work.

Before all and above all thanks to God for giving me health and patience to continue my study.

Tamer Emam Hassan El-Negmy

Utilization of spider cage for dynamic balance improvement in Spastic hemiparetic cerebral Palsy Children. *Tamer Emam Hassan El-Negmy*. Supervisors: Prof. Dr. *Elham El Sayed Salem*, Dr. *Manal Salah El-Din Abd El wahab* and *Dr. Nagi Sobhi Nassif*. Department of Physical Therapy for Growth and Development Disorder and Surgery in Children, Faculty of Physical Therapy, Cairo University, 2007 (Master Degree).

#### **Abstract**

Thirty, spastic hemiparetic cerebral palsy children of both sexes with age ranging from 4 to 6 years old with balance problem and abnormal gait pattern subdivided randomly into two groups of equal number, control and study groups. Evaluation was conducted before and after three successive months of treatment using spasticity, balance and gait analysis. The control group received neurodevelopmental techniques outside the spider cage while the study group received the same exercises but inside the spider cage using its facilities. Significant difference was recorded in favor of the study group after the treatment which supports using of spider cage in treatment of hemiparetic cerebral palsy children.

#### **Contents**

``	Page
Chapter I	
Introduction	1
* Statement of the problem.	2
* Purpose of the study.	2
* Significant of the study.	3
* Delimitations.	3
* Limitations.	. 3
* Basic assumptions.	4
* Hypothesis.	4
Chapter II	
Literature Review	5
* Cerebral palsy.	5
* Postural control.	21
* Development of standing.	40
* Universal exercise unit (Spider cage / Sunbeam therapy).	51
* Balance.	61
Chapter III	
Subjects, instrumentations and procedures	71
a) Subjects.	71
b) Materials:	71
* For evaluation.	71
* For treatment.	76

Conte	n	Ĺ
-------	---	---

•

	Page
c) Methods:	: 79
* For evaluation.	79
* For treatment.	83
Chapter IV	:
Results.	112
Chapter V	
Discussion.	. 155
Chapter VI	
Summary and conclusion.	167
References	169
Appendix	188
Arabic summary	

.

#### List of tables

	Page
Table (1): Causes of cerebral palsy	8
Table (2): Classification of cerebral palsy according to severity	10
Table (3): Cerebral palsy type and suspected etiology	10
Table (4): Sequence of development of standing	41
Table (5): Descriptive data of study and control groups	112
Table (6): Frequency distribution of sex and affected side in	113
both study and control groups.	
Table (7):Comparison of the mean values of hip flexion, knee	114
flexion and ankle plantar flexion angles (degrees)	
during initial contact pre treatment for the study and	
control groups.	
Table (8): Comparison of the mean values of hip flexion, knee	116
flexion and ankle plantar flexion angles (degrees)	
during toe off pre treatment for the study and control	
groups.	
Table (9): Comparison of the mean values of stride length (m),	118
cadence (steps/min), velocity (m/sec) and cycle time	
(sec) pre treatment for the study and control groups.	
Table (10):Comparison of the mean values of balance pre	122
treatment for the study and control groups.	
Table (11): Comparison of the mean values of hip flexion, knee	123
flexion and ankle plantar flexion joints angles	
(degrees) during initial contact pre and post	
treatment for the study group.	
Table (12): Comparison of the mean values of hip flexion, knee	125
flexion and ankle plantar flexion joints angles	ı
(degrees) during toe off pre and post treatment for	
the study group.	127
<b>Table (13):</b> Comparison of the mean values of hip flexion, knee flexion and ankle plantar flexion angles (degrees)	127
during initial contact pre and post treatment for the	
control group.	
Table (14): Comparison of the mean values of hip flexion, knee	129
flexion and ankle plantar flexion angles (degrees)	
during toe off pre and post treatment for the control	ł
group	ı

Table (15): Comparison of the mean values of stride length (m.), cadence (Steps/min.), velocity (m / sec.) and	131
cycle time (Sec.) pre and post treatment for the study	
group.	125
Table (16): Comparison of the mean values of stride length (m),	135
cadence (steps/min), velocity (m/sec) and cycle time	
(sec) pre and post treatment for the control group	
Table (17): Comparison of the mean values of balance pre and	139
post treatment for the study group	
Table (18): Comparison of the mean values of balance (point	140
scores) pre and post treatment for the control group	
Table (19): Comparison of the mean values of hip flexion, knee	141
flexion and ankle plantar flexion angles (degrees)	
during initial contact post treatment for the study and control groups	
Table (20): Comparison of the mean values of hip flexion, knee	143
flexion and ankle plantar flexion angles (degrees)	
during toe off post treatment for the study and	
control groups	
Table (21): Comparison of the mean values of stride length (m),	145
cadence (steps/min), velocity (m/sec) and cycle time	
(sec) post treatment for the study and control groups	
Table (22): Comparison of the mean values of balance post	149
treatment for the study and control groups	
Table (23): Percentages of improvement of hip flexion, knee	150
flexion and ankle planter flexion angles during	
initial contact in the study & control groups at the	
end of treatment	
Table (24): Percentages of improvement of hip flexion, knee	151
flexion and ankle planter flexion angles during toe	
off for the study and control groups at the end of	
treatment	
Table (25): Percentages of improvement of stride length (m),	153
cadence (steps/min), velocity (m/sec) and cycle time	
(sec) for the study and control groups at the end of	
treatment	
<b>Table (26):</b> Percentages of improvement of balance (score point) for the study and control groups at the end of	154
treatment	
ii cumon	<u> </u>