Characteristics of Motor Development in Relation to Healthy Relationships

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Children’s Network 28th Annual Conference
Objectives

» Discuss the impact of maltreatment on childhood occupations.

» Identify motor development challenges.

» Discuss the outcome of a recent study done by the Department of Occupational Therapy

» Discuss strategies that promote appropriate development of motor skills through typical child friendly household activities.
Introduction

• Consequences of maltreatment
  o Disruptions in typical brain development which may impact:
    • Language
    • Social-emotional
    • Cognitive
    • Motor
    • Sensory processing

• Impact of maltreatment
  o Play
  o Sleep
  o Self care
  o School-readiness

Anda, R.F et al, 2006; Cermak, 2009; Gaskill & Perry, 2013; Koomar, 2009:
Centers for Disease Control and Prevention (CDC)

Child maltreatment is a public health problem

~ In 2011 1,570 children died in USA
~ The total lifetime economic burden resulting from new cases of fatal and nonfatal child maltreatment in the United States is approximately $124 billion
In San Bernardino County, the Children and Family Services (CFS) received 13,402 reports of child abuse or neglect between January and June 2011

(Performance, Education & Resource Center, County)
Maltreatment and Motor Development

» Motor development characteristics of children exposed to maltreatment is sporadic (Anda et al 2006).

» A child affected by maltreatment often present with atypical characteristics which impact the ability to participate and engage in daily occupations.

» The negative effects of exposure to trauma can impact motor development which may cause children to experience challenges in performing daily activities and occupations.
Purpose Statement

The purpose of this retrospective study was to explore the motor development of children who had been exposed to maltreatment.
Methods

The study analyzed retrospective data gathered from the Peabody Motor Development Scales Assessment (PDMS-2).

- Data collected from West End Family Counseling (West Valley SART)
- August 14, 2008 to June 1, 2013
- 15 data sets of pre and post intervention, de-identified
- Children age 4 months to 56 months
PDMS-2

» It is composed of six subtests that measure interrelated motor abilities
» Children age from birth through 5 years of age
» Reliability and validity have been determined empirically
» Normative sample consists of 2,003 persons residing in 46 states
» Criterion Referenced: normative data

Gross Motor Subtests

**Reflexes**: Measures aspects of the child’s ability to automatically react to environmental events.

**Stationary**: Measures a child’s ability to sustain control of his or her body within its center of gravity and retain equilibrium.

**Locomotion**: Measures a child’s ability to move from one place to another. The actions measured include crawling, walking, running, hopping, and jumping forward.

**Object manipulation**: Measures a child’s ability to manipulate objects. Examples of the actions measured include catching, throwing, and kicking.

Fine Motor Subtests

**Grasping:**
~ Measures a child’s ability to use his or her hands
~ Begins with the ability to hold an object with one hand
~ Progresses to actions involving the controlled use of fingers of both hands

**Visual-Motor Integration:**
~ Measures a child’s ability to use his or her visual perceptual skills to perform complex eye-hand coordination tasks
~ Examples include:
  • Reaching and grasping for an object
  • Building with blocks
  • Copying designs

Fine and Gross Motor Quotients

» The FMQ combines the scores obtained on grasping and visual motor integration (VMI) subtests.

» GMQ combines the scores obtained on the reflex, stationary, object manipulation, and locomotion subtests.
Procedures

IRB Process:

- Reviewed and approved by LLU Institutional Review Board for human studies.
- De-identified data obtained from West End Family Counseling
- Entered into SPSS for analysis
- Analyzed data using descriptive statistics and comparison
Data Analysis

• Pre- and Post-test data analyzed
  o Organized by Subtest Group
  o GMQ and FMQ determined

• Subtests with incomplete data discarded
  o Gross Motor Subtests: Reflexes
  o Fine Motor Subtests: Object Manipulation

• Descriptive Statistics Determined
  o Subtests with complete data
    ▪ Grasping
    ▪ Visual-Motor Integration
    ▪ Stationary
    ▪ Locomotion
Results

- The range of data sets: **4 months** to **56 months** of age
- The time between pre and post administration of the PDMS-2: **4 months** to **19 months** in time.

<table>
<thead>
<tr>
<th>Percentile Rank (%)</th>
<th>Standard Score Ranges</th>
<th>Pre FMQ</th>
<th>Post FMQ</th>
<th>Pre GMQ</th>
<th>Post GMQ</th>
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<td>1-3</td>
<td>7</td>
<td>2</td>
<td>6</td>
<td>1</td>
</tr>
</tbody>
</table>

*other ranges include standard scores 13-20 correlating to percentile ranks 84% - 99%. However, no data sets fell within these ranges.*
Visual-Motor Integration Subtest Pre and Post Assessment Standard Scores

![Bar chart showing the comparison of Initial Visual-Motor Integration and Post Visual-Motor Integration scores across different data sets. The chart displays the standard score values for each data set, with blue bars representing Initial scores and red bars representing Post scores.](image-url)
Figure 3. Stationary Subtest Pre & Post Assessment Standard Scores
Figure 4. Locomotion Subtest Pre & Post Assessment Standard Scores

Data Set

Standard Score Value

Initial Locomotion
Post Locomotion
Conclusion

» **Grasping**: 93.3% (n=14) improved

» Visual-Motor Integration: 80% (n=12) improved or remained the same

» **Stationary**: 93.3% (n=14) improved or remained the same.

» Locomotion: 87% (n=13) improved
Limitations

» Variables:
  ~ Time elapsed between pre and post administration of PDMS-2
  ~ Unknown number of occupational therapy sessions and attendance
  ~ Reunification
  ~ Unknown home environment
Discussion

These delays impact the child’s ability to engage in:

~ Play
~ Feeding
~ Academics
~ Social Participation

*Community service providers play a vital role in enhancing a child’s potential to participate in these childhood occupations*
Development of hand skills
&
Strategies to promote appropriate
Fine motor development
Hand skills and children’s occupations

» Play

» Activities of daily living:
   ~ Feeding
   ~ School functions
   ~ Dressing
Typical and Atypical Motor Development

» Video
Promote Reaching

(Exner, 2010)

“The development of reaching is described in terms of the changes that take place in the control and speed of hand’s movement toward the object and the preparation of the hand for grasp.” (p. 278)
Promote Reaching During Play

» Supine

» Prone

» Sitting
Tummy Time to Promote Motor Development

» Video
Tummy Time

» Tummy time is overall an important milestone for our young ones

» It aids in developing
  ~ Fine Motor Skills
  ~ Visual Skills
  ~ Overall body strength
Tummy Time can happen anytime!

» I don’t have time for tummy time!
» I have tile floor
» My child is on the floor… in playpen!
» My child doesn’t do anything on the floor… he likes to sit.
» It is fun for a child… work for parents
Promoting Fine Motor Skills
Meal Time
Promoting Fine Motor Skills

Play
Play Cont...
Promoting Fine Motor Skills
Household Chores
Promoting Fine Motor Skills
Self-care
Promoting Fine Motor Skills
School Activities
School Activities Cont...
Activities to Promote Fine Motor Skills

» Activity
Questions/discussions
Thank you to....

» West End Family Counselling (West Valley SART)
» Loma Linda University, School of Allied Health
  Department of Occupational Therapy

» Research Advisors:
  • Arezou Salamat OTD, OTR/L
  • Heather Javaherian-Dysinger, OTD, OTR/L
  • Esther Huecker PhD, OTR/L, FAOTA
  • Liane Hewitt DrPH, OTR/L

» Grenith Zimmerman, PhD
» Ashley Jordan, Allison Doucette, Healther O’Toole, Leta Moss
References


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Thank you