

THE EFFECTS OF HOME LEARNING ENVIRONMENT IN PRESCHOOLER PSYCHOMOTOR DEVELOPMENT

Aurela Saliq, MD, MA, PhD

Faculty of Public Health, University 'Ismail Qemali', Vlora, Albania.

Alketa Hoxha, MD, MA, PhD,

Faculty of Medical Science, University of Medicine, Tirana, Albania.

Majlinda Zahaj, MD, MA, PhD

Sonila Nikaj, RN, MA

Faculty of Public Health, University 'Ismail Qemali', Vlora, Albania.

Bruna Pura, MD, MA

NHS Hospital London, UK

Abstract

Background: Several studies have accumulated evidence for the impact of home environment in the preschooler psychomotor development. We wanted to evaluate how the percentages and the relationships of these variables in our country are.

Aim of the study: To evaluate how the preschooler's psychomotor development can be influenced by home learning.

Material and methods: This study was conducted in a sample of preschool children in Vlora, Albania. After measuring their psychometric parameters with Age and Stage Questionnaires-3, we evaluated two crucial elements of home learning environment: the quality of child's room and the book-reading with the parents. In the end of the study we evaluated the associations within these variables.

Results: Only 31% of children in this study have a separate well-designed room and 66% of them have shared book-reading with their parents. The odds rate of relationship between room design quality and the level of child psychomotor development is OR=5.2 (P<0.05). The odds rate of relationship between book-reading and the level of child psychomotor development is OR=3 (P<0.05).

Conclusions: The level of child psychomotor development is higher when he is raised in a rich stimulating home learning environment. It was children with well-designed rooms (lots of colours and play toys, suitable for their development stage) who have significantly better parameters comparing with

other two groups. We found also that children who are stimulated through book-reading are more likely to take high psychomotor scores too.

Keywords: Psychomotor development, home learning environment, book-reading, Age and Stage Questionnaires-3, preschool children

Introduction

Several studies have accumulated evidence for the impact of home environment in the preschooler's psychomotor development. Black (1990) reached the conclusion that the formation of new synapses is related with learning. Recent studies have suggested that the family environment of learning (home learning), may be particularly important in understanding the cognitive development of the child. (Baker-Henningham, 2010) (Duursma, 2012)

Environmental stimulation may be the most relevant parameter in the study of psychomotor development of children. (Sanhueza A, 2006). Stimulating domestic environment can promote the child's communication and learning skills. In particular, is stressed that the room design and child furniture with materials, toys, books, must be made in accordance not with chronological age, but with the current stage of development of the child. (Sarsour, 2011) (Mackrides P S, 2011).

Numerous studies have collected data on the connection between learning environment at home when the kids are in preschool (for example: interactions in reading books) and their psychomotor development, and capacity to learn at school age. While 'learning' and 'socio-emotional stimulation' are significantly connected with reading skills, reading comprehension is a significant predictor 'for linguistic stimulation in parent-child interactions' (S.Lehrl 2012).

However little is known about what exactly do parents at home (besides reading the books) to encourage communication and learning in their children (the number of books at home to raise children, reading daily; the pleasure of parents in reading children; dialoguing on book reading or TV programs, singing songs with the children, rhymes). (Duursma, 2012)(Dickinson, D., 2001)

The data underline the importance of home learning environment and insist on scientific researches that use multiple methods to detect mechanisms that can promote the functioning of the environment.

Aim of the study

In this article we aim to evaluate how the preschooler's level of psychomotor development and the psychometric delays can be influenced by

home learning. We tent to prove the assumption that the enriched stimulating environment improves the psychomotor parameters.

Material and Methods

This is a cross-sectional study and was conducted in a sample of preschool children in Vlora, Albania during a 6-months period. The study sample included all 133 preschool children, enrolled in two kindergartens, public and private. Children enrolled in these institutions are from all socio-economic classes, according to their father's occupation. The children with established diagnoses in mental disorders were excluded.

We have measured the psychomotor parameters to all of them using ASQ-3 (*Age&Stage Questionnaires-3*; Squires&Bricker 2009). The sample of children was divided by level of psychomotor development, according to taken ASQ-3 scores. Low level of psychomotor development is when child takes between 151 to 200 scores in ASQ-3, middle level is 201-250 ASQ-3 scores and high level is 251-300 ASQ-3 scores.

We have also evaluated the children delays in each of 5 domains of ASQ-3 and their overall scores.

After dividing the preschoolers in three psychomotor levels, we evaluated two crucial elements of children home learning environment in each level: the quality of child's room and the book-reading with the children parents. We assessed at their home if every child had a separate home space for himself, and if this space was poorly or highly-quality equipped (full of various objects, play materials, colours and music) based on instructions (about gross motor and fine motor toys) at the end of ASQ-3 for every preschooler development stage. About book-reading we asked the parents only if it happened or not, and didn't ask about specific elements, as book comments, time spending with the child, type or number of children books they have at home.

In the end of the study we evaluated the associations within these variables.

Results and Discussion

Quality of child room design

Results of our study showed that only 31% of children under the study had separated rooms, designed in base of cognitive stimulation framework for their development stage (table 2).

The average of psychomotor development of children without a separate room was 232 scores (ASQ-3), 24% of them had a low level of psychomotor development (151-200 scores ASQ-3), 29% of them had high level (251-300 scores ASQ-3). 25% of this group had typical development (0 psychometric delays) and 39% of them had ≥ 2 delays. Children with

separate, but poor designed rooms had an average of 233 scores (ASQ-3), 26% of them had a low level of psychomotor development, 30% of them had high level. 26% of this group had typical development and 35% of them had ≥ 2 delays. Children with separate, rich stimulating room environment had an average of 245 scores (ASQ-3), only 10% of them had a low level of psychomotor development and 63% of them had high level. 41% of this group had typical development (0 psychometric delays) and only 28% of them had ≥ 2 delays (tables 1,2).

The most sensitive domains to the quality of room environment were Problem solving and Personal-social, where the percentage of delays, in children who live in well-designed rooms, was lower (respectively 22% and 25%) compared to percentage of delays, in children who live in inappropriate-designed rooms (39% and 48%) or who have no separated room at all (32% and 49%) (table 2).

Children without separate rooms and the ones with separate, simple rooms performed approximately the same psychomotor parameters, while the third group of children (with well-designed rooms) took significantly higher ASQ-3 scores in all domains (respectively from 25-26% to 41% of children with typical development; from 39-35% to 28% of children with more than 1 psychomotor delay) (table 2). The same tendency is noted in the average developmental scores and in the distribution in base of development levels as well (tab.1). 85% of low psychomotor level children are from two first groups and 15% of third one.

Comparing the distribution of children between low (141-200 ASQ score) and middle (201-250 ASQ scores) psychomotor level (table 1) we note that the Odds ratio is low and not statistically significant (OR=1.4, $p=0.6$). While the odds of having high psychomotor level in children with appropriate designed room are significant (OR=5.2, $p=0.006$).

| Tab. 1 – The level of psychomotor development based on room design. | | | | | |
|--|---|---------------------------|---------------|-------|---------------------------------------|
| ASQ-3 scores | children without or with simple-designed room | children appropriate room | with designed | total | Odds ratios |
| 141-200 | 22 | 4 | | 26 | OR=1.4 95%CI=0.4-4.9, P=0.5937 |
| 201-250 | 43 | 11 | | 54 | |
| 251-300 | 27 | 26 | | 53 | OR=5.2 95%CI=1.6-17.4, P=0.0062 |
| total | 92 | 41 | | 133 | |

Tab. 2 – Percentages of development delays according to children’s room design.

| Room design for preschool children | Number of children | communication | global motor | fine motor | problem solving | personal-social | 0 delays | 1 delay | ≥2 delays | average scores of psychomotor development |
|---|--------------------|---------------|--------------|------------|-----------------|-----------------|-------------|-------------|-------------|---|
| children without separated room | 69=51% | 20 % | 15 % | 24 % | 32 % | 49 % | 25 % | 33 % | 39 % | 232 |
| children with simple-designed room | 23=17% | 9 % | 4 % | 30 % | 39 % | 48 % | 26 % | 39 % | 35 % | 233 |
| children with appropriate designed room | 41=31% | 22 % | 28 % | 25 % | 22 % | 25 % | 41 % | 28 % | 28 % | 245 |
| χ^2 P-value <0.16 | | | | | | | | | | |

Lots of studies have suggested that learning environment, which should be in a separate area, could be important in understanding the cognitive development of children (Shonkoff 2000) (Osorio E, 2010). In their study Avan BI et al (2014) have stated that sensory stimulation in rural homes may be a significant factor influencing the child development. As in our study, Kamla-Raj (2009) has found a significant association too between home environment and psychomotor developmental indices of children.

Book-reading

Interactions child-parent could have an extraordinary positive or negative effect on child development, according to EffectivePhilanthropy.com. Spending time with children (teaching them through reading or playing with several types of hand-toys) could have a positive impact on their development. On the other side, parents who ignore or neglect the positive interaction with their children, could worsen their psychomotor development. (Johnson W, 2007)(Meijer, 2010). Static balance and locomotion (gross motor skills) and grasping and visual-motor integration (fine motor skills) are associated with particular aspects of home stimulation, such as parent-child interaction, verbal reinforcement of the child's positive actions and providing the child with clear boundaries. (Osorio E, 2010)

In our study, we too found that percentages of psychometric parameters are significantly related with interaction child-parent through book-reading (χ^2 p-value<0.035) (tab.3,4). Frequenting kindergartens, all these children are involved in group-activities (reading books, telling

fairytale and discussing about), so the difference in psychomotor development between two groups is made by the time and quality of home individual stimulation.

We asked parents if they spend time with their children reading books and resulted that 34% of parents under the study didn't take in consideration reading books with their children. Significant differences were found among lots of psychometric parameters between two groups. The group of children who spend time reading books with parents had better parameters: the average of development was 242 scores comparing with 225 scores in the other group, respectively 33% to 22% in typical development, 30% to 47% of children with more than 1 psychometric delay.

We haven't found significant differences in Communication, the Global motor was worse in children whose parents read book to them (20% delays to 7% in the other group), and in all other domains the book-reading children have better parameters (tab.4) (respectively 20%,22%,37% to 33%,44%,56%). The percentage of children with low development level was 33% in not book-reading group and 12% in book-reading one. The percentage with high level was respectively 27% and 45%. Children, who are stimulated through book-reading are more likely to have high development level, comparing with children who haven't got this kind of stimulation (OR=3, p=0.0026).

| Tab. 3 – The level of psychomotor development based on book-reading. | | | | |
|---|--|--|-------|---------------------------------------|
| ASQ-3 scores | children whom don't get book-reading done with parents | children whom get book-reading done with parents | total | Odds ratios |
| 141-200 | 15 | 10 | 25 | OR=3.0 95%CI=1.2-8.2 P=0.024 |
| 201-250 | 18 | 37 | 55 | |
| 251-300 | 12 | 39 | 51 | OR=3.08 95%CI=1.7-13.6 P=0.0026 |
| total | 45 | 86 | 131 | |

| Tab. 4 – Percentages of development delays according to book-reading with children. | | | | | | | | | | |
|--|--------------------|---------------|--------------|------------|-----------------|-----------------|----------|---------|-----------|---|
| Book-reading activity | Number of children | communication | global motor | fine motor | problem solving | personal-social | 0 delays | 1 delay | ≥2 delays | average scores of psychomotor development |
| children whom don't get book-reading done with parents | 45= 34% | 18 % | 7 % | 33 % | 44 % | 56 % | 22 % | 29 % | 47 % | 225 |
| children whom get book-reading done with parents | 86 = 66% | 19 % | 20 % | 20 % | 22 % | 37 % | 33 % | 36 % | 30 % | 242 |
| χ^2 P-value <0.035 | | | | | | | | | | |

Conclusions

Home learning environment is important for psychomotor development. In this study we found that children who haven't got separate rooms and the ones whose rooms are simple-designed have approximately same psychomotor parameters. It was children with well-designed rooms (lots of colours and play toys, suitable for their development stage) who have significantly better parameters comparing with other two groups. We found also that children who are stimulated through book-reading are more likely to take high psychomotor scores too.

So, a more stimulating home learning environment (through room-designing and book-reading) leads to a higher level of psychomotor development and to a lower number of delays.

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