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Socioeconomic Status of Family And Availability of Home Affordances for Motor Development

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Abstract: Stimulating home environment and variety of home affordances are essential for optimum growth and development of an infant, especially motor development at early developmental stages. Affordances in home environment for motor development-infant scale (AHEMD-IS) is a recently developed and validated tool for assessment of home affordances for motor development and it has been used in many studies. However, there is a little data from the Indian subcontinent related to the relation of socioeconomic status of the family and home affordances for childhood development. Main objective of the study was to evaluate the association between the home affordances for motor development and the socioeconomic status (SES) of the family. Total 460 infants in the age group of 3-18 months were enrolled in the study. AHEMD-IS tool was used to evaluate the home affordances and socio-economic status was evaluated from family income, social-class and educational status of the parents by using Kuppuswamy scale. The results of this study showed that in the baseline family profile of the studied families, most of the families were in lower middle class and majority of parents had high school education, most of families had one child or another sibling of the study infant, and two adults residing in the family. On applying Kruskal Wallis test it was found that all aspects of AHEMD-IS had positive correlation with family SES. Socioeconomic status has an important impact on availability of home affordances for motor development; although many dimensions of home affordances have wider scope of modification, so as to customize them for better motor development irrespective of family SES.

Keywords: home environment, socioeconomic status, family, motor development, infant

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1. INTRODUCTION

In early childhood years, home environment is of prime importance in nurturing and stimulating the optimum development of a child including motor competence[1]. The relationship between quality of home environment and the level of motor development has been a field of active research for many decades. Many studies related to motor development in infancy and early childhood, have shown that more stimulating and supportive home environments are related to better motor scores in infants.[2-6.] Socio-economic status (SES) of the family has often been considered as an important factor influencing the child development.[7] Many different methods have been used for measuring SES of the family and in the absence of a single best indicator; typically, a combination of factors is used to assess the family SES. In the context of childhood development, the most commonly used measures of family SES are education/occupation of the parents and household income/conditions.[8,9.] Many studies have been reported in literature, which assessed the influence of family SES on child's motor development. In general, these studies have reported lower motor scores for children belonging to low SES families.[10-12] It has been postulated that better SES of the family can lead to better availability of toys and other materials in the home, which has a positive impact on child development. Better educational and financial status of the parents and other caregivers can lead to better parent-child interactions and better child-rearing practices in the family, with the resulting positive influence on the child development.[13.] Most pioneering work in the field related to home environment and childhood development was done by Bradley and Caldwell who in 1984, proposed the concept of home observation for measurement of environment (HOME) inventory.[14] Although HOME inventory was not designed specifically to assess the association of home environment with motor development in children, the concept of availability of toys for providing stimulating environment for learning and its relation to child development, further drew the attention of researchers towards role of affordances in home on early motor development. On the basis of these observations, the concept of home affordances has been proposed. Affordances are opportunities that provide stimulation for actions to happen. For example, availability of inside and outside space in home provides opportunity to play outdoor games and for walking. Another example is the variety of toys in the home which provide the child chances of exploration and learning.[15,16.] In assessment of home environment in context of affordances for motor development in children a recently developed and validated tool, Affordances in Home Environment for motor Development (AHEMD) has been used in few studies.[17-20.] The present study was undertaken to evaluate the association between the home affordances and family socioeconomic status as there is little data from the Indian subcontinent related to this aspect of infant and child development. Similar to the above-mentioned studies, we used AHEMD tool to assess the motor affordances in home.

2. MATERIALS AND METHODS

This study was conducted in the immunization setting of a public level district hospital designated as Civil Hospital in Faridkot district of Punjab, India. Immunization setting allows the best approach to meet parents while coming for infant vaccination. This study was approved by the research ethics committee of Desh Bhagat University, Mandi Gobindgarh, Punjab, India and written permission was obtained from the Senior Medical Officer (SMO) of Civil Hospital, Faridkot, Punjab. Study population consisted of infants aged 3- 18 months and their parents. Purposive sampling technique was used, sample size was selected using power analysis. Calculated sample size was around 380, which was increased to 460 to account for any incompleteness of the collected data. Written informed consent was taken from parents for participation in the study. Home assessment for affordances in the home environment for motor development was done using Affordances in Home Environment for Motor Development-Infant Scale (AHEMD-IS) tool. Researcher assisted approach was used to get questionnaires filled from parents for self-reporting of home affordances. Baseline profile of the family was collected by questionnaire and socioeconomic profile was studied using Kuppuswamy scale which is the most commonly used socioeconomic class scale in India.[21] Using this scale, each of the study family was classified as belonging to one of the five socioeconomic categories: lower, upper-lower, lower-middle, upper-middle or upper. AHEMD-IS consists of questions related to four dimensions; viz., physical space (1-7), variety of stimulation (8-15), gross motor toys (16-21) and fine motor toys (22-26). Further scoring of all dimensions has been done: for physical space (0-7), for variety of stimulation (0-20), for fine motor toys (0-10) and for gross motor toys (0-12). Physical space and variety of stimulation dimensions of AHEMD-IS were assessed by asking questions and to evaluate the number of gross and fine motor toys pictures were shown to parents for the self-reporting of home affordances. Total scoring was sum total of all four dimensions (0-67). Overall scoring and interpretation were done for each infant.

3. STATISTICAL ANALYSIS

Data were analyzed using IBM SPSS software's descriptive and inferential statistical techniques (SPSS software, version 23, SPSS Inc., Chicago, IL, USA). The p-value of ≤ .05 was considered significant. Evaluation of association between SES and motor affordances was done using Chi-square and Kruskal-Wallis tests.

4. RESULTS

The main objective of the study was to find the association between the SES and home affordances for motor development. Baseline characteristics of the family were assessed using a structured questionnaire. Objective-wise analysis was done using descriptive and inferential statistics. Results of study are presented in the form of tables and figures. In table 1 description of family characteristics is given.

Table 1: Baseline family characteristics of study subjects		
Variable	**Frequency**	**Percentage**
Number of adults living in home		
Two adults living	153	33.3%
Three adults living	75	16.3%
Four adults living	144	31.4%
Five adults living	80	17.4%
Six adults living	8	1.7%
Number of children living in home		
Only one child of parents	115	25%
One child living	200	43.5%
Two children living	111	24.1%
Three children living	22	4.85%
Four children living	7	1.5%
Five children living	5	1.15%

In one-third of the families (33.33%), two adults were residing in the home and in 31.4% of the families, four adults were residing. In 17.4% of cases five adults were residing in the home and in 16.3% of families three adults were residing in the home. Only 1.7% of families had six adults living in the family. Description of children living in the home shows that most of the infants had company of another child at home. In 25% of the families the study infant was the only child in the family. In 24.1% of cases the infant had company of two other children in the family. On assessing the educational status of the parents (table 2), it was found that the most common pattern of parental educational qualification was of up-to high school or less (mothers: 54.8%, fathers: 42.4%). This was followed by parental educational qualification of senior secondary school level (mothers: 22.8%, fathers: 30.4%). Rest of the sample has shown that the education of the mother was graduation in 15.7% followed by post-graduation in 6.7%. Regarding the qualification of father, it was found that 16.5% had completed graduation, whereas 10.7% were post-graduates.

Table 2: Educational status of mother and father of study subjects		
Variable	**Frequency**	**Percentage**
Education of father		
High school or less	195	42.4%
Senior secondary	140	30.4%
Graduate	76	16.5%
Post-graduate	49	10.7%
Education of mother		
High school or less	252	54.8%
Senior secondary	105	22.8%
Graduate	72	15.7%
Post-graduate	31	6.7%

The socioeconomic class of each family was classified using the Kuppuswamy scale. It was found that more than a third of the study families (35.2%) were categorized in lower-middle class, whereas 32.8% of the families were categorized as upper-lower class. The remainder of the sample was categorized as upper-middle class (14.3%), upper class (7.8%) and lower class (9.8%). To study the association of home affordances with family SES, Kruskal-Wallis test was applied (table 3). It was found that all home affordance dimensions were highly influenced by socioeconomic status of the family. Families with higher socio-economic class have provided more variety of stimulation ($p< 0.001$, $\chi^2= 113.631$), more play materials ($p< 0.001$, $\chi^2= 193.470$) and more physical space in the home ($p= 0.007$, $\chi^2 = 87.404$); than families of lower socioeconomic status

Table 3: Comparison of AHEMD-IS scoring of motor affordances with socioeconomic status of family

	Socio-economic class	N	p-value	χ^2
Physical space	Lower	45	**0.007***	87.404
	Upper Lower	151		
	Lower Middle	162		
	Upper middle	66		
	Upper	36		
Variety of stimulation	Lower	45	**0.000***	113.631
	Upper Lower	151		
	Lower Middle	162		
	Upper middle	66		
	Upper	36		
Play material	Lower	45	**0.000***	193.470
	Upper Lower	151		

	Lower Middle	162		
	Upper middle	66		
	Upper	36		
Total score	Lower	45	**0.000***	213.860
	Upper Lower	151		
	Lower Middle	162		
	Upper middle	66		
	Upper	36		
AHMED-IS: Affordances in Home Environment for Motor Development, *p<0.05				

Similarly, to find the association of maternal education with home affordances Kruskal-Wallis test was used and results have shown that, all home affordances dimensions were influenced by the educational status of the mother (table 4). Higher maternal education correlated with better physical space in the home (p= 0.007, χ^2 = 12.153), higher variety of stimulation (p= 0.000, χ^2=48.488) and more play materials (p= 0.000, χ^2= 71.477).

Table 4: Comparison of AHEMD-IS scoring with maternal education

	Education of mother	N	p-value	χ^2
Physical space	High School	252	**0.007***	12.153
	Some College	105		
	College graduate	72		
	Post Graduate	31		
Variety of stimulation	High School	252	**0.000***	48.488
	Some College	105		
	College graduate	72		
	Post Graduate	31		
Play material	High School	252	**0.000***	71.477
	Some College	105		
	College graduate	72		
	Post Graduate	31		
Total score	High School	252	**0.000***	74.851
	Some College	105		
	College graduate	72		
	Post Graduate	31		
AHMED-IS: Affordances in Home Environment for Motor Development, *p<0.05				

The relation of motor affordances and the level of paternal education is shown in table 5.

Table 5: Comparison of AHEMD-IS scoring with Paternal education

	Education of father	N	p-value	χ^2
Physical space	High School	195	**0.007***	27.279
	Some College	140		
	College graduate	76		
	Post Graduate	49		
Variety of stimulation	High School	195	**0.000***	61.163
	Some College	140		
	College graduate	76		
	Post Graduate	49		
Play material	High School	195	**0.000***	103.325
	Some College	140		
	College graduate	76		
	Post Graduate	49		
Total score	High School	195	**0.000***	105.367
	Some College	140		
	College graduate	76		
	Post Graduate	49		
AHMED-IS: Affordances				

in Home Environment for Motor Development, *p<0.05

It was seen that, all home affordance dimensions had positive association with paternal education. Higher paternal education correlated with better physical space in the home (p= 0.007, χ^2 = 27.279), higher variety of stimulation (p= 0.000, χ^2=61.163) and more play materials (p= 0.000, χ^2= 103.325).

5. DISCUSSION

The results of current study have shown significant association of home affordances with socioeconomic status. All the dimensions of AHEMD, viz: total space in the home, variety of stimulation and gross and fine motor toys all are affected by the family's socioeconomic status. Parents with high socio-economic status had provided more variety of toys and a stimulating environment. It is likely that better SES of the family leads to a better provision of affordances for motor development of the child. Children in families with good SES have better access to home learning resources including age-appropriate toys, books etc., which stimulate child development.[22-25] Also, these families are likely to have better indoor and outdoor spaces in their homes so that a child can move and play freely. In contrast, the families with low SES are likely to live in a crowded neighborhood with smaller, congested houses, which limit the affordance of good indoor and outdoor space for the physical activities of the children.[26-28] Moreover, the parents in families with good SES are likely to be more educated and hence are likely to spend more time with their children and to take their care in a better way in both health and disease. [29-31.] In a study by Cacola et al., regarding affordances in home and motor development in infants of 3-18 months of age, significant differences in AHEMD-IS total scores were found for socioeconomic status. It was postulated that the families with higher SES were able to provide their infants with toys and space, the parameters which had positive correlation with motor development.[19] The results of our study are similar to those of this study. Similarly, in a study by Ferreira et al., in 707 children of age group of 6 to 10 years, it was found that motor development increased as the family SES increased and good home affordances was partially responsible for this relationship. In this study, the model using family SES as predictor, home affordances as the mediator and child's age as the moderator variable; explained for 17% of the variation observed in the motor development.[32]. A study by Rezendes and Catela from Portugal, explored the conditions for motor development in the home environment of children between 18 to 42 months of age. In this study, it was found that family's income was positively associated with total AHMED score and it is the most influential variable related to home affordances for motor development.[33] Similar results have been seen in our study. A study by Freitas et al., assessed the relation between the socioeconomic status of family and affordances in home using AHEMD- IS tool. The sample of this study was 300 families with infants of age 3-18 months of age. The results of this study had shown significant impact of SES indicators on the availability of play material and physical space. The physical space dimension was influenced by family's economic class and income; the play materials dimensions were influenced by all SES indicators (family SES, income and parent's education level); whereas, daily activities dimension was not influenced by any SES indicator.[7] In contrast, in our study we found that variety of stimulation (child plays with other children, parents play games with child, practice learning body parts) were significantly related to family SES. Similar findings were reported by Guryan et al., who found that parents with low levels of education spent less time taking care of their children; poorly educated mothers (less than high school degree) dedicated only 12.1 hours per week to their children while mothers with higher education (college educated mothers) spent anaverage 16.5 hours per week in taking care of their children.[34] This study noted that maternal education levels had a positive influence on quantity and quality for home affordances for motor development. This study also identified that mothers with higher education levels were those with higher SES. Our study is the first reported study from India using AHEMD tool to assess motor affordances. We had quite a modest sample size of the study population. However, there are some limitations to our study such as single study setting and age limit of up-to 18 months, which limit the ability to generalize the results.

6. CONCLUSION

Stimulating home environments play a vital role in infant overall development including motor development. Availability of a variety of gross and fine motor toys is highly influenced by family SES. However, in many areas of the home environment like interaction of children with parents and with other children, provision of outdoor activities could be increased to compensate for deficiencies in certain dimensions caused by low family SES.

7. AUTHOR CONTRIBUTIONS

SK: Conceptualization, data collection, data analysis, manuscript preparation, final approval; RKR: Conceptualization, data analysis, manuscript editing, final approval

8. CONFLICT OF INTEREST

There are no conflicts of interest

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10. REFERENCES

1. Flôres, F.S., Rodrigues, L.P., Copetti, F., Lopes, F. & Cordovil, R. (2019). Affordances for Motor Skill Development in Home, School, and Sport Environments: A Narrative Review. Percept Mot Skills.126(3):366-388. doi:10.1177/0031512519829271

2. Abbott, A.L., Bartlett, D.J., Fanning, J.E. & Kramer J. (2000). Infant motor development and aspects of the home environment. Pediatric Physical Therapy.12(2): 62–67

3. Fuligni, A.S., Han, W.J. & Brooks-Gunn, J. (2004). The infant-toddler HOME in the 2nd and 3rd years of life. Parenting. 4(2–3):139–159.

4. Haydari, A., Askari, P. & Nezhad, M.Z. (2009). Relationship between affordances in the home environment and motor development in children age 18-42 months. Journal of Social Sciences. 5(4):319.

5. Miquelote, A.F., Santos, D.C.C., Cacola, P., Montebelo, M.I.L. & Gabbard, C. (2012). Effect of the home environment on motor and cognitive behavior of infants. Infant Behavior & Development.35:329–334. doi:10.1016/j.infbeh

6. Soares, E.S., Flores, F.S., Katzer, J.I., Valentini, N., Corazza, S.T. & Copetti, F. (2015). Analise das oportunidades de estimulac ¸ao motora em ambientes domiciliares na regiao central do Rio Grande do Sul [Analysis of motor stimulation opportunities in home settings in the central region of Rio Grande do Sul]. Revista Brasileira de Educac ¸a˜o Fı´sica e Esporte. 29(2):279–288.

7. Freitas, T.C., Gabbard, C., Caçola, P., Montebelo, M.I. & Santos, D.C. (2013). Family socioeconomic status and the provision of motor affordances in the home. Braz J Phys Ther.17(4):319-327. doi:10.1590/S1413-35552013005000096

8. Galobardes, B., Shaw, M., Lawlor, D.A., Lynch, J.W. & Smith, G.D.(2006). Indicators of socioeconomic position (part 1). J Epidemiol Community Health. 60:7-12. doi:10.1136/ jech.2004.023531

9. Galobardes, B., Shaw, M., Lawlor, D.A., Lynch, J.W. & Smith, G.D.(2006). Indicators of socioeconomic position (part 2). J Epidemiol Community Health. 60:95-101. doi:10.1136/jech.2004.028092

10. Venetsanou, F. & Kambas, A. (2010). Environmental Factors Affecting Preschoolers' Motor Development. Early Child Educ J.37:319-27. doi:10.1007/ s10643-009-0350-z

11. Chowdhury, S.D., Wrotniak, B.H. & Ghosh, T. (2010). Nutritional and socioeconomic factors in motor development of Santal children of the Purulia district, India. Early Hum Dev.86(12):779-84. doi:10.1016/j.earlhumdev.2010.08.029

12. Zoghi, A., Gabbard, C., Shojaei, M. & Shahshahani, S. (2019). The Impact of Home Motor Affordances on Motor, Cognitive and Social Development of Young Children. Iranian Journal of Child Neurology.13(2):61-69. doi:10.22037/ijcn.v13i2.17044

13. Bradley, R.H., Caldwell, B.M., Rock, S.L., Barnard, K., Gray, C., Hammond, M. & Johnson, D. (1989). Home environment and cognitive development in the first 3 years of life: A collaborative study involving six sites and three ethnic groups in North America. Dev Psychol.25:217–235. doi:10.1037/0012-1649.25.2.217

14. Gibson, E.J. (2002). Perceiving the Affordances: A Portrait of Two Psychologists. Erlbaum.

15. Stoffregen, T.A. (2000) Affordances and events. Ecol Psychol.12:1-28. doi:10.1207/ S15326969ECO1201_1

16. Rodrigues, L.P., Saraiva, L. & Gabbard, C. (2005). Development and construct validation of an inventory for assessing the home environment for motor development. *Res Q Exerc Sport*.76(2):140-148. doi:10.1080/02701367.2005.10599276

17. Gabbard, C., Caçola, P. & Rodrigues, L.P. (2008). A new inventory for assessing affordances in the home environment for motor development (AHEMD-SR). Early Childhood Edu J.36(1): 5–9

18. Caçola, P., Gabbard, C., Santos, D.C. & Batistela, A.C. (2011). Development of the Affordances in the Home Environment for Motor Development-Infant Scale. Pediatr Int.53(6):820-825. doi:10.1111/j.1442-200X.2011.03386.x

19. Caçola, P.M., Gabbard, C., Montebelo, M.I. & Santos, D.C. (2015). Further Development and Validation of the Affordances in the Home Environment for Motor Development-Infant Scale (AHEMD-IS). Phys Ther.95(6):901-923. doi:10.2522/ptj.20140011.

20. Hsieh, Y.H., Hwang, A.W., Liao, H.F., Chen, P.C., Hsieh, W.S. & Chu, P.Y. (2011). Psychometric properties of a Chinese version of the Home Environment Measure for Motor Development. Disabil Rehabil.33(25-26):2454-2463. doi:10.3109/09638288. 2011.574775

21. Shaikh, Z. & Pathak, R. (2017). Revised Kuppuswamy and B G Prasad socio-economic scales for 2016. Int J Community Med Public Health. 4:997-9

22. Evans, G.W. (2004) The environment of childhood poverty. Am Psychol. Feb-Mar;59(2):77-92. doi: 10.1037/0003-066X.59.2.77.

23. Duncan, G. J., Brooks-Gunn, J., & Klebanov, P. (1994). Economic deprivation and early childhood development. Child Development, 65, 296–318.

24. Evans G. W. (2006). Child development and the physical environment. Annual review of

psychology, 57, 423–451. https://doi.org/10.1146/annurev.psych.57.102904.190057

25. Noble, K. G., Houston, S. M., Brito, N. H., Bartsch, H., Kan, E., Kuperman, J. M., Akshoomoff, N., Amaral, D. G., Bloss, C. S., Libiger, O., Schork, N. J., Murray, S. S., Casey, B. J., Chang, L., Ernst, T. M., Frazier, J. A., Gruen, J. R., Kennedy, D. N., Van Zijl, P., Mostofsky, S., … Sowell, E. R. (2015). Family income, parental education and brain structure in children and adolescents. Nature neuroscience, 18(5), 773–778. https://doi.org/10.1038/nn.3983

26. Adolph, K. E., Cole, W. G., Komati, M., Garciaguirre, J. S., Badaly, D., Lingeman, J. M., Chan, G. L., & Sotsky, R. B. (2012). How do you learn to walk? Thousands of steps and dozens of falls per day. *Psychological science*, *23*(11), 1387–1394. https://doi.org/10.1177/0956797612446346

27. Smith, J. R., Brooks-Gunn, J., & Klebanov, P. (1997). Consequences of living in poverty for young children's cognitive and verbal ability and early school achievement. In G. J. Duncan & J. Brooks-Gunn (Eds.), Consequences of growing up poor (pp. 132–189). New York: Russell Sage Foundation.

28. Braveman, P., Egerter, S., & Williams, D. R. (2011). The social determinants of health: coming of age. Annual review of public health, 32, 381–398. https://doi.org/10.1146/annurev-publhealth-031210-101218

29. Aber, L., Bennett, N., Conley, D., & Li, J. (1997). The effects of poverty on child health and development. Annual Review of Public Health, 18, 463–483.

30. Hoff, E., & Laursen, B. (2019). Socioeconomic status and parenting. In M. H. Bornstein (Ed.), Handbook of parenting: Biology and ecology of parenting (pp. 421–447). Routledge/Taylor & Francis Group.

31. Aikens, N. L., & Barbarin, O. (2008). Socioeconomic differences in reading trajectories: The contribution of family, neighborhood, and school contexts. Journal of Educational Psychology, 100(2), 235–251.

32. Ferreira, L., Godinez, I., Gabbard, C., Vieira, J., & Caçola, P. (2018). Motor development in school-age children is associated with the home environment including socioeconomic status. Child: care, health and development, 44(6), 801–806. https://doi.org/10.1111/cch.12606

33. Rezendes,P. & Catela, D. (2020). Motor affordances in family context of children 18 to 42 months, from a urban coastland county of Portugal. Psychology Research, 10(7), 280-284

34. Guryan, J., Hurst, E. & Kearney, M.S. (2008). Parental education and parental time with children. J Econ Perspect.22(3):23–46.