International Journal of Current Research and Modern Education (IJCRME)
Impact Factor: 6.925, ISSN (Online): 2455 - 5428
(www.rdmodernresearch.com) Volume 3, Issue 1, 2018

EFFECT OF ENVIRONMENT FACTORS ON PARTICIPATION OF CHILDREN WITH CEREBRAL PALSY – LITERATURE REVIEW

Kurinji Chelvan S* & Chinduja S**
* Lecturer, Department of Occupational Therapy, CRC, Kozhikode, Kerala
** Assistant Professor, AWH College of Physiotherapy, Kozhikode, Kerala

Cite This Article: Kurinji Chelvan S & Chinduja S, "Effect of Environment Factors on Participation of Children with Cerebral Palsy – Literature Review", International Journal of Current Research and Modern Education, Volume 3, Issue 1, Page Number 468-472, 2018

Introduction:

"Developmental Disabilities" is one of the commonest conditions in India due to brain injury in the earlier stage of life. (1) (2). In 1980s, Cerebral Palsy was described William Little, and it is one among the commonest conditions in developmental disabilities (2). Cerebral Palsy prevalence rate ranges from 1.5 to 2.5 per 1000 (1). Cerebral palsy is the chronic disability and makes postural and tonal issues in children due to non-progressive brain lesion. This lesion may occur perinatal, natal or postal period and it often results with cognitive, motor, sensory, communicative, and behavioural disorders as well as epilepsy is common co-morbid issues which all leads to limitation of functional activities, restricted social participation (3). Based on biopsychosocial model (ICF frame work), cerebral palsy makes impact on individual's body structure and functioning, activities and participation, these makes participatory restriction and activity limitation (4) (5). Many factors like physical capacity, environmental factors are commonly determine individual's functional abilities (6). In many studies, it is highlighted that environmental factors make much impact of participation level and functional ability (7). Along with physical disabilities, if there are any other Health conditions, it limits their participation level and independency level of their ADL skills (6) (7) (8). Further to these, it also affects their quality of life and self-esteem (6). The severity of Cerebral Palsy obstructs children to utilise their functional capacity at different environments. Afsoon et al mentioned that normal children participation level was comparatively higher than cerebral palsy children participation, at the same time, in adapted environment their participation level were greater than normal peers (9). Studies suggested that customised environment and contest facilitates independency level, comprising personal factors and environmental factors (4) (5).

According to ICF classification, Participation as "a person's involvement in life situations" (10) (11) (12), is also considered as an important outcome of rehabilitation interventions and as a human right (10). According to OTPF, Participation areas are classified as: Activity Daily of Living (ADL), Instrumental Activity Daily of Living (IADL), work, play, leisure, education, rest/sleep/ social participation (13). Based on conceptual model of leisure, physical, social, attitudinal and institutional based environments are the key factors of determining children's participation level (10). In some studies, to emphasizing the importance of participation, authors mentioned participation as social participation (11). Existing evidences show that participation at various contexts facilitates cognitive skills, peer group interaction, working capacity, quality of life, self-confidence, sense of competence, development, and social interaction and minimize emotional and behavioural issues. In addition to these, it facilitates health status and weight reduction for children and adults (9) (10) (11) (15). Due to environmental barriers for persons with disabilities, their level participation is comparatively lesser than normal population. Hence, their low level physical activity or inactiveness leads to secondary deformities and being a hindrance for their participation (14). Physical inactivity can lead to increased body weight, depression and other medical complications among persons with disabilities (15). Studies demonstrate that intrinsic factors (e.g., age and gender) and extrinsic factors (family situation, culture, and the living place) can have impact on the children's level of Participation (9). Persons with disabilities experience many barriers to engage in regular physical activity especially physical barriers and attitudinal barriers.

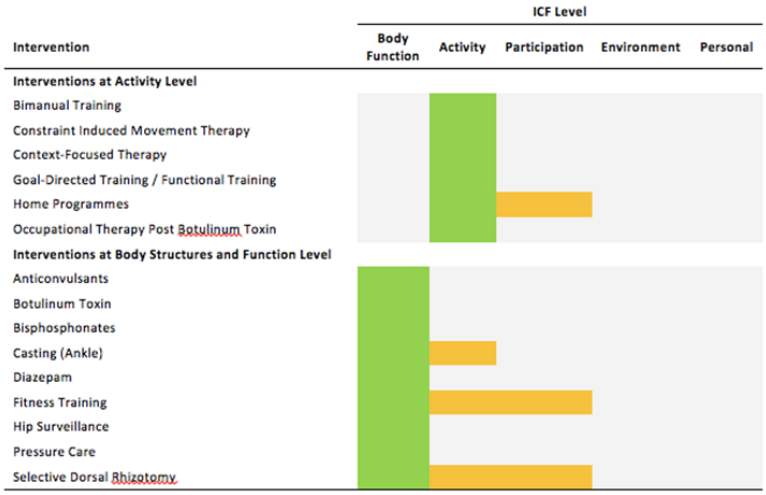
There are several studies focused on finding barriers and facilitators for persons with disabilities in regarding their participation level. There results highlighted that transportation and physical environment were the major barriers (15). Based on ICF frame work, environmental factors were organized based on five environmental domains of the ICF:

- ✓ Natural Environment (e.g. residency, climate, landforms)
- ✓ Products and Technology (e.g. accessibility of buildings)
- ✓ Support and relationships (e.g. parental involvement)
- ✓ Attitudes (e.g. perception towards disability)
- ✓ Services, Systems and Policies (e.g. community programs)

Usually, landforms and climates and accessibility of buildings are merged as a single component for assessment (10) (7).

The Division for Early Childhood (DEC) Recommended Practices (2014) suggest aspects of physical (e.g., space and equipment), social (e.g., attitude and relationship of peers and other family members), and temporal (e.g., sequence of routines and activities) environments that can be altered to support young children's learning (10). In some studies, the built environment has been described as other dimensions like density, destinations and design (15). Barriers in the physical environment make them to feel unsafe for mobility and reduce their participatory level. Due to their insecurity feelings their functional ability was restricted. On the other hand, accessible environment enhance their level participation and performance and reduce their level of energy expenditure (15). As majority of our time is spent in our home environment, this primary context should be accessible for improve our participation in social life. The accessibility of home environment shows better result on independency level of their daily functional skills (16). Certain studies supported that family, friend's supports and geographic locations were as common facilitators for participation. Attitudes, transportation, Government policies, attitudes of general population, attitude and approaches of services providers were major barriers (8). Due to influence of personal and environmental factors individual's physical activity and level of participation were affected. A recent review identified several physical, psychological, and environmental variables were positively associated with physical activity in children with physical disabilities (17).

Table 1: Specific therapeutic interventions with the strongest evidence base for CP. (5)



With above seen evidences, it is deserved to pay more attention on intrinsic and extrinsic factors to determine an individual performance level and participatory level. In particular, this relationship concerns the degree to which access to utilises in the environment is facilitated or obstructed, depending on the functional capacity of individuals. (19) (20)

Purpose of the Study:

Enhancing independency level and active participation are the major goal for Occupational therapy services. But researchers pay less attention to the participation areas and its related environment factors. Most of the researchers focused to the sensory, motor or cognitive components of individuals. Even if researched focused performance areas in their studies, it would be more or less about ADL components and other areas are least focused (6). In recent days more number of therapeutic interventions is available for treating, train children with cerebral palsy, though very few theories and interventions are focusing on the environmental domains. Hence, the study is focused to explore the importance of environmental facilitator and barrier factors, to find out the importance of ecological based interventions for cerebral palsy children.

Methods:

This narrative review of the literature was appropriate to meet the objectives of this study. The scoping review focused on "Effect of environmental factors on participation of children with cerebral palsy". This review followed data search, selection of studies, data collection and summarizing the results of findings. Related studies were collected through databases such as PubMed and Google Scholar. The keywords were employed and their combinations: cerebral palsy, activity limitations, social participation, participation restrictions, functional limitations, Activity engagement, physical barriers, environmental barriers, built environment, universal design, accessible environment.

Table 1: Examples of search terms

Participation	Disability	Environment
Limitation of Activity Social Participation Activity Participation Quality of Life Functional Limitation	Cerebral Palsy Children With Disabilities Developmental Disabilities Disabled Children	Barrier Free Environment Physical Barrier Architectural Barriers Architectural Accessibility Environmental Factors

Physical Activity Activity Engagement		Environmental Barriers Environmental Measures Built Environment Accessible Environment Universal Design Community Barriers

Results:

Sandra et al conducted a study on environmental features to find out the need of individuals and availability of universal design; in their study 594 children with cerebral palsy were evaluated. Result of the study showed that 99% of children with Cerebral Palsy were in need of larger size rooms, different walking aids, adapted toilets, accessible transport facilities, parking space and ramps in public places. Further to these, 100% of respondents mentioned that they were in need of lifts and hoists, suitable doorways in public places and communication aids. But the availability of nature and physical environment factors were from 17% to 65%. Additional to these, all respondents mentioned that positive attitude, support and encouragement of family members/friends, were more important; the availability that factors varies from 70% to 98%. Sandra et al conducted a study on social support, results showed that 99% of children were in need of financial assistance for procuring aids and appliances, do changes in their home environment, need of awareness about different welfare schemes and policies of Government, information about available leisure and sports activities, parents support group and counselling. The availability of these factors varies from 38% to 76% (8). 449 children were surveyed about their perception about environmental factors. It included accessibility to exercise equipment; safety of walking in their community; accessibility to various facilities related to physical activity like recreation centre, gym or park. In some reviews, it was focused more on sidewalks, different landscapes like hills, heavy traffic, street-lights, stray dogs, safety, climate and less attractive scenery; these factors were considered as lead to physical inactivity. In that study mentioned that less attractive (scenery) environment was more related to physical inactivity for rural women. Urbanisation issues like heavy traffic, lighting, noise and density of transportation related to great risk for elderly population and restricted their mobility. Hence, it concluded that focusing on environment factors would lead to better result to enhance physical activity of elders instead of focusing on individual-oriented theories (18).

In regarding public transportation, comparative study was done between parents of typically developed group and disabled group. A higher percentage of parents of children with disabilities expressed that they had insufficient transportation, discomfort to use public transportation and needed assistive devices or equipments to support them. Their perception about layout of home and public places varies from the parents of typically developed children (7). Cunningham et al study results showed that community design include accessibility for pedestrian; shopping areas and other environment made impact of participation level of geriatric population especially on waling. This review highlighted specifically about seniors and specific elements of build environment linked to physical activity in the general population (18). Lin-Ju et al stated that higher percentage of parents with disabled children mentioned about attitudes of member in community. Concern about community people's attitude was higher for parents with disable children than typically developed children's parents. In addition, they highlighted that they used to get less assistance and support from others in public environment (7).

Ru Li et al mentioned in their conclusion about relationship between physical activity and motivation from mothers to their children. Interestingly, in school environment, relationship between physical activity and mother encouragement showed positive results and also mentioned, in home environment, father's presence showed positive results in behaviours of children. Hence, it is suggested that fathers tend to interact more with children (17). Darrah et al had done research with clinicians who had implemented a different environment-based approach (context therapy), their results explored that clinicians preferred to do performance components (biological mode) based interventions (5). Various factors such as: Government policies (Community, education, business), physical and structural (technology, design of school, community and natural environmet) leads to poor educational performance of children with cerebral palsy through affecting their participation and self-esteem. Minimizing these barriers and providing more facilitators for education improves participatory level in education (6).

Lin-Ju et al concluded that Community resources or barriers showed significant differences between physical disabilities group and typical development group. It explored that insufficient services and facilitators in the public places limits the functional capacity of individuals (7). As part of the community development, planning process, urban development planners, officials, health/rehabilitation professionals should understand the quality, accessibility of built environment. It is necessary to conduct frequent walk ability audits in the public environment which measures condition and quality of environment, such as broke or incomplete pathways. Though there are many assessment tools exist for auditing, it is not clear how often such auditing has to be implemented, Government policies are not clear in regarding execute these audit results and punishment or penalties for not following the standard guidelines (18). Pashmdarfard M et al stated in their study that the

leisure activity participation of cerebral palsy children were lower than other children, it was due to lack of access and less awareness about benefits of leisure activities.

It was considered that individual, structural and socio cultural are the effective barriers to participation in leisure activities. It concluded less number of service providing agencies, parental awareness, lack of home modifications, awareness and availability of assistive devices were mentioned as barriers of participation of Iranian cerebral palsy children in BADL and IADL. It reported that poor awareness among parents about how to take care of their children, knowledge about benefits of facilitation to participate in sleeping and rest activities and its influence on participation of CP children in the field of rest/sleep. Further to these, the field of Education participation influenced by physical environment barriers, classmates and their parents' attitudes, teachers and policies related to education of persons with disabilities. It suggested that maximizing facilitators and decreasing barriers to access opportunities, lead to improve their work participation. Due to religious abuse, socio cultural barriers, economical barriers and inadequate government's supports restricts level of participation of children with Cerebral Palsy than normal development children (13). Greater participation of children with Cerebral Palsy was associated with inclusive educational programs and appropriate community based recreational activities were obtained.

Availability of rehabilitation services and community-based services were associated with greater participation. Similarly, frequent numbers of series from inclusive school environment were also increased rates of participation in recreation activities among young adults with autism (10). As ICF is based on the broader biospychosocial model of disability, it would be appropriate to pay more focus on person-environment interaction factors. The barrier free environment reflects on their mobility, safety and security. Review suggested several implications for practice and policy. Children with disabilities, parents and clinicians, for instance, can work together on time use and planning-ahead strategies to facilitate participation. Parental education about environmental barriers, useful strategies to remove environmental barriers and advocacy for enhancing accessibility in community settings. These initiations may also help to improve attitudes and reduce stigma related to disability with community members. Government and stakeholders can formulate new policies and legislation to enhance universal design and participation level of all age group; for example, by promoting ''universal design'' public spaces and by making information about the resources, services and rights of children with disabilities more accessible (10). Negative factors in the environment make stronger impact on participation of children than on adults (12).

Discussion:

There is an increasing numbers of research evidence regarding the role of the environment in explaining participation in children and adult with physical disabilities. Many of the studies related to environmental domains mainly focused on natural environment, products and technology and supportive domains, very few studies are available, related to social, policy and attitude domain. Further to these, there are various definitions and components are considered as environmental factors, due to various classifications and components, it was difficult to evaluate the quality of available studies and reliability of their findings. At the same time, these study result provided orientations about importance of environmental factors related to participation of cerebral palsy children. It explained some available scales to evaluate participation of cerebral palsy children, their limitation and environmental facilitator and barriers related to functional performance. The study highlights that as parents of children with disabilities experience many challenges, importance of parental training programs related to environmental factors, need of financial benefits, policies and acts related to the welfare of disabilities are essential. The study results explain the necessity of proper definition, classification, standardised assessments and policies related to environmental factors for creating barrier free environment for all. Further to this majority of the available studies related to environmental factors are focused on older adults than children population. As environmental barriers differ to each individuals based on their functional ability and their needs, we cannot infer findings of older adults to younger adults with disabilities. Addition to these, it is necessary to include people with various type of physical disabilities, sensory and cognitive disabilities in these studies to get further understanding of the built environment's role to enhance participation of whole population in the society. (10)

Conclusion:

This is the pilot study to evaluate the effect of environmental factors on participation of children with cerebral palsy. The findings of this review reveal that changes in the environment factors facilitate participation of children with cerebral palsy. In addition, results highlighted the importance of parental empowerment, creating universal design for participations, effect of attitudinal barriers, natural environment and available supportive and policies for creating accessibility for persons with disabilities. The clinicians should change their intervention focus from biological frame work to biopsychosocial frame work to provide better improvement for the beneficiaries. Researchers should do more focus on the involvement of various environmental factors which affect participation of population by including all type of disability conditions in their study. Government and stakeholders should create policies and implement in proper ways to enhance the level of participation of persons with disabilities. Further to these, it is more important to implement social welfare policies and establish

an integrated, accessible environment for all. As most of the studies measured the barriers in the environment, thus in the future researchers should also focus on the positive environmental features. In addition to this, studies are needed to quantify the impact of environmental factors, creating proper definitions and standardised assessments for evaluating environmental factors. Lastly, the studies included mostly focused on physical disabilities, so extending these results to other disabilities may not yet be appropriate.

References:

1. Rehabilitation Council of India Publications: Cerebral Palsy.
2. Chitra Sankar and Nandini Mundkur: Cerebral Palsy-Definition, Classification, Etiology and Early Diagnosis. Indian Journal of Pediatrics, Volume 72- October, 2005.
3. Sima Ajami et al: The Role of Information Systems to Manage Cerebral Palsy, Iran Journal of Children Neurology, Spring 2016; 10(2): 1-9.
4. Iona Novak, Sarah Micintyre et al: A systematic review of interventions for children with cerebral palsy: state of the evidence. Developmental Medicine & Child Neurology 2013.
5. https://www.physiopedia.com/Specific_Therapeutic_Interventions_for_Individuals_with_Cerebral_Palsy
6. Byoung-Hee Lee: Relationship between gross motor function and the function, activity and participation components of the International Classification of Functioning in children with spastic cerebral palsy. Journal of Physical Therapy and Science 29: 1732-1736, 2017.
7. Lin-Ju Kang, Ming-Chieh et al: Environmental Barriers to Participation of Preschool Children with and without Physical Disabilities, International Journal of Environmental Research and Public Health 2017, 14, 518.
8. Sandra Martina Espin-Tello et al: How available to European children and young people with cerebral palsy are features of their environment that they need? Res. Dev. Disability 2017, December; 71: 1-10.
9. Afsoon Hassani et al: The Comparison of Participation in School-Aged Cerebral Play Children and Normal Peers: A Preliminary Study. Iran journal of Pediatrics 2016, June; 26(3):35303.
10. Dana Anaby, Carri Hand: The effect of the environment on participation of children and youth with disabilities: a scoping review. Disability and Rehabilitation an International, multidisciplinary journal, 2013; 35(19): 1589-1598.
11. Barbara Piskur et al; Parents' actions, challenges, and needs while enabling participation of children with a physical disability: a scoping review, BMC Pediatrics 2012, 12:177.
12. International Classification of Functioning, Disability and Health, Children and Youth version.
13. Pashmdarfard M, Amini M et al; Participation of Iranian Cerebral palsy Children in Life Areas: A Systematic Review Article. Iran Journal of Child Neurology Winter 2017; 11(1): 1-12.
14. Yochai Eisenberg, Kerri A et al: Does the built environment moderate the relationship between having a disability and lower levels of physical activity? A systematic review. Preventive Medicine 95 (2017) S75-S84.
15. Vijay Vasudevan et al: Development of the Barriers to Physical Activity Questionnaire for People with Mobility Impairments. Disability Health Journal 2015 October; 8(4): 547-556.
16. Marianne Granbom, Sussane Iwarsson et al: A public health perspective to environmental barriers and accessibility problems for senior citizens living in ordinary housing. BMC Public Health (2016) 16:772.
17. Ru Li,Cindy Hui-Pin Sit, Jane Jie Yu: Children with Physical Disabilities at School and Home: Physical Activity and Contextual Characteristics. International Journal of Environmental Research and Public Health. 2017, 14, 687.
18. Bjorn Slaug, Oliver Schilling: Typology of person-environmet fit constellations: a platform addressing accessibility p[roblems in the built environment for people with functional limitations. BMC public Health (2015) 15:834.
19. Antonio Trabacca, Teresa Vespino et al: Multidisciplinary rehabilitation for patients with cerebral palsy: improving long-term care. Journal of Multidisciplinary Healthcare, 2016; 9, 445-462.
20. Grazia O. Cunningham et al: Concepts guiding the study of the impact of the built environment on physical activity for older adults: A Review of Literature. American Journal of Health Promotion, 2014: 18(6): 435-443.