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Title: Executive functions and leisure participation characteristics of adolescents with and without learning disabilities.

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Abstract

In recent years, there is an upward trend in the prevalence of the diagnosis learning disabilities (LD) and it is now known to be 10-15% among the population. LD may appear at any stage throughout the circle of life and affect a person's functioning characteristics in varied areas of life such as daily activities, learning, work, and leisure.

Occupational therapy intervention is occupationally focused and takes place across life span. It's goal is to achieve one's optimal integration in the web of life. The person-environment-occupation (PEO) model (Law et al., 1996) describes the clinical and theoretical application of the interaction between persons and their occupations in the environment. This interaction guides the clinical reasoning of occupational therapists.

The World Health Organization (WHO) acknowledges that health can be influenced by lack of ability to perform an activity, to participate in life situations and by difficulties in body structures and functions (WHO, 2001). The organization developed and published the International Classification of Functioning Disability and Health (ICF) that aims to describe the relationship between human functioning, disability and health. The ICF model combined with the PEO model served as the theoretical framework of this study. These references examine the implications of impairments in body structures and functions, such as executive functions, that characterize a body function as learning disabilities on involvement and participation in everyday activities, including leisure activities.

Executive functions (EF) are essential functions required for performing complex or irregular tasks and are utilized in varied occupations in everyday life. Studies have attempted to understand the nature of the relationship between EF and LD, yet, opinions are divided.

Leisure occupations constitute approximately 40% of adolescents' time and are a central component of their everyday life as well as varied social activities. Knowledge of adolescents' leisure preferences can assist in directing financial and social recourses. Persons with LD may experience difficulties in the social domain and in participation in leisure activities. Despite the significant importance of leisure among adolescents, as far as known, updated information about the leisure characteristics of adolescents in Israel with and without LD has yet to be gathered. In addition, the relationship between the level of EF control and leisure participation characteristics of adolescents with LD has yet to be researched.

Study objective: To examine whether there are significant differences and correlations between the level of EF control and leisure participation characteristics among adolescents with and without LD.

Study hypotheses:

1. Significant differences will be found between the two groups (with and without LD) in the total EF score and clinical scales scores as measured by the Behavior Rating Inventory of Executive Function questionnaire (BRIEF; Gioia et al., 1996) and the Behavior Rating Inventory of Executive Function – Self Report questionnaire (BRIEF-SR; Guy et al., 2004).
2. Correlation will be found between the adolescents self-reports on the BRIEF-SR (Guy et al., 2004) and the parents reports on the BRIEF (Gioia et al., 1996) regarding the total EF score and the clinical scales scores as measured in both questionnaires.
3. Significant differences will be found between the two groups in the four dimensions of the Children's Leisure scale Assessment (CLASS; Rosenblum, Sachs, & Schreuer, 2010) (Variety, Frequency, Sociability, Preference) and the four factors (Indoor leisure activities, outdoor activities, self-enrichment and games and sports).
4. Correlations will be found between groups between the "sociability" dimension of the CLASS (Rosenblum, Sachs, & Schreuer, 2010) and the clinical scales of the BRIEF-SR (Guy et al., 2004): shifting, emotional control, planning/organization, monitoring and inhibition.

Study population: Participants included 64 Hebrew speaking and writing adolescents in grades 7-12 and their parents, who were recruited in a convenience sample. The study group included 32 adolescents without physical or mental disabilities, who were diagnosed with LD by a qualified professional and are recognized as such by the educational system in Israel. The control group included 32 adolescents without LD, physical or mental disabilities, by self-report, matched to the study group by age, gender, living environment and socio-economic status.

Measures: 1) Developmental demographic questionnaire. 2) Child Evaluation Checklist (CHECK; Rosenblum, 2012). 3) Behavior Rating Inventory of Executive Function (BRIEF; Gioia et al., 1996). 4) Behavior Rating Inventory of Executive Function Self- Report (BRIEF-SR; Guy et al., 2004). 5) Children's Leisure Assessment Scale (CLASS; Rosenblum, Sachs, & Schreuer, 2010).

Procedure: After obtaining authorization from the ethics committee of the Haifa University, participants were recruited, signed consent forms, completed the questionnaires and sent them in a pre-paid envelope.

Data Analysis: Data was analyzed using SPSS. Descriptive statistics of the demographic study group data was performed and internal reliability of the questionnaires was performed by alpha cronbach. Differences in EF control level and leisure participation characteristics were examined by means of t-tests and MANOVA. Pearson correlations were performed to assess correlations between the adolescents' reports and their parents' reports concerning their EF control level and to examine correlations between the CLASS and BRIEF-SR questionnaires.

Results: Adolescents coping with learning disabilities have significantly lower EF control than their typical friends. Additionally, significant correlations were found between the adolescents self-report and their parents report concerning their EF control level. No differences were found in leisure participation characteristics between adolescents with and without learning disabilities. However, differences were found for some specific activities. Partial correlation was found between the CLASS (Rosenblum, Sachs, & Schreuer, 2010) and the BRIEF-SR (Guy et al., 2004) questionnaires as correlation was found between scores of the EF 'shifting' and 'emotional control'

and the general and outdoor activities social dimensions of the CLASS (Rosenblum, Sachs, & Schreuer, 2010) within the control group.

Conclusions: The study results indicate that adolescents with LD cope with EF deficits. However, similar leisure participation characteristics were found among the study and control groups, excluding some specific activities. The results partially support the ICF (WHO, 2001) and the Israeli adaptation of the Occupational Therapy Practice Framework (Yalon-Chamovitz et al., 2006) assumption that a disability such as LD, that affects a body function such as EF, may impair participation in various occupations such as leisure. Also, it was determined that adolescents as their parents are a reliable source for information about their EF and the way in which they manifest in the youngsters daily lives. Therefore, the assessment process of adolescents should include the family and measure participation in all occupational domains of their everyday life and the different body and functional components.