

Self-Regulation Skills of Preschool Children with Impulsivity Attending Nursery Schools in Sharkia, Egypt

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Abstract

Background: Impulsivity is a multifaceted construct known to play a crucial role in the development and maintenance of a wide range of problematic behaviors and psychological disorders in children. **Aim of the study** was to assess self-regulation skills of preschool children with impulsivity attending nursery schools. **Subjects and Methods: Research design:** A cross-sectional descriptive research design was used. **Setting:** The study was conducted at two nursery schools in " Diarb Negm" city, Sharkia governorate, Egypt. **Subjects:** A purposive sample of 150 children was recruited for the study. **Tools of data collection:** three tools were used in the present study; A structured interview questionnaire, Matching Familiar figure Test (MFFT) scale, and Self-regulation scale from the Child Self-Regulation & Behavior Questionnaire (CSBQ). **Results:** Findings revealed that 33.3% of children in the total study sample were impulsive. Nearly half of the study sample had deficient self-regulation skills. Also, a highly statistically significant relationship was found between impulsivity and self-regulation skills. **Conclusion:** lack of self-regulation skills was associated with impulsivity, with statistically significant relation. **Recommendations:** self-regulation training programs should be implemented to enhance impulsivity among preschool children. Further researches should be developed to address the risk factors of impulsivity and poor self-regulation skills and how to manage them.

Keywords: Preschool children, impulsivity, self-regulation skills

Introduction

Early childhood period is the time where mental and physical development is extremely rapid and where many building blocks related to an individual's future life are formed and shaped. Therefore, this period is an important and a sensitive process [1]. Children in early childhood show a myriad of individual differences in their typical thoughts, behaviors, and emotions. Some children respond quickly without control or planning, do not consider consequences, and make errors on task especially tasks that require comparisons among alternatives. This stable disposition is described as impulsivity [2]. Impulsivity which associated with a lack of self-regulation is a common feature in many mental disorders such as ADHD, substance abuse, and personality disorder. Impulsivity in preschoolers has been linked with poor social skills related to a peer rejection, deviant problem solving, and academic failure. Furthermore, impulsivity at a young age can worsen over time; reach serious levels in the later years [3]. Self-regulation refers to the skills and processes associated with the direction, planning, and control of attention, emotion, and behavior that are necessary for optimal adaptive functioning. Self-regulation includes both executive function skills and emotion regulation skills [4]. Community health nurses play a vital role for prevention, early identification and management of mental and behavioral disorders in children. They can help children and their caregivers in different aspects as assessment of a specific problem by appropriate history and detection of responsible factors, teaching skills like emotion identification, self-regulation, problem-solving, perspective-taking, and calm-down strategies, and assisting teachers and parents for necessary modification of environment at home, school and community [5].

Significance of the study

Since preschool period is a critical period for the development of children, the experiences obtained in this period leave significant marks in the development of children. So, it is necessary to explore relationship between children with impulsivity and their self-regulation skills and to produce more effective and rapid solutions and take preventive measures against emergence of possible problems. Therefore, the ignorance of this relationship might lead to adverse behavioral outcomes such as

(dropping out of school, substance use, crime and poor school performance), emotional disturbances, isolation, and depression. Additionally, there is underestimation of the prevalence of impulsivity as a result of scarcity of studies.

Aim of the study

The aim of this study was to assess self-regulation skills of preschool children with impulsivity attending nursery schools.

Research question

The current study aimed to answer the following research question:

Is there a relationship between impulsivity and self-regulation skills among preschool children attending nursery schools?

Subjects and Methods

Research design

Across-sectional descriptive research design was used to conduct this study.

Setting Study

The study was conducted at two nursery schools in "Diarb Negm" city, Sharkia governorate, Egypt, according to simple random sampling technique.

Study subjects

A purposive sample of 150 children aged between $4 \leq 6$ years was recruited for this study. The sample size was calculated to demonstrate a correlation coefficient of 0.3 or higher with 90% power and at a 95% level of confidence between the score of self-regulation and impulsivity.

Tools of data collection

Three data collection tools were used in this study.

Tool I: An Interviewing Questionnaire: It was designed by the researcher to assess data related to demographic characteristics of children and their parents. It included:

- Personal data such as child's age, gender, number of friends, and birth order.
- Life-style behaviors such as sleeping hours and screen-time exposure.
- Parents' information as job, residence, family size, level of education and income.

Tool II: Matching Familiar figure Test (MFFT) scale (Kagan, 1965) [6]: this scale was used to measure cognitive impulsivity. The scale consists of 12 matches to standard items and two initial practice items. Each child was interviewed individually to select the single figure which matches the sample item. Each test item comprises one standard picture with six similar variants.

Tool III: Self-regulation from Child Self-Regulation & Behavior Questionnaire (CSBQ, Howard and Melhuish, 2017) [7]: this scale consists of 34 items relating to children's everyday behaviors. These items combine to assess children's self-regulation and social development. Self-regulation scale consists of 17 items and contains two domains of self-regulation (executive functions regulation) and emotional regulation). Each item was rated by the child's teacher on a 5-point Likert scale from "Not true" to "Very true" about the child.

Validity and reliability

The tools were translated into Arabic and reviewed by a group of three experts in the fields of pediatric, community health nursing, and psychologists, who conducted face and content validity of all items. Reliability of these tools was tested using the internal consistency method. It proved to be reliable with Cronbach alpha coefficient in the following: MFFT: .84.& CSBQ: .79.

Field work

After obtaining permission to carry out the study, the researcher met teachers and parents on predetermined schedule and started by introducing herself, and briefly explained to them the purpose of the study. Then, written consent for participation of the children was obtained and assured that the obtained information is strictly confidential and used only for the purpose of the study. Each parent of children, teacher, and child was interviewed individually to fill in the study tools. The researcher scheduled 2days/week. The time consumed for answering these study scales ranged from 40-50 minutes. The duration of data collection lasted approximately 4 months, started from the beginning of October 2018 to the end of January 2019.

Pilot study

A pilot study was carried out on a sample of 15 children to test feasibility, applicability and clarity of the tools and to estimate the time needed for filling in the forms. Those who shared in the pilot study were excluded from the main study sample.

Administrative and Ethical Considerations

Official permissions were obtained from the pertinent authorities. The study protocol was approved by the research committee at the Faculty of Nursing, Zagazig University. Informed consent was obtained from the parents through the directors of the selected nursery schools. These included the aim and objective of the study, as well as its procedures. It also clarified the rights to refuse or withdraw, as well as the confidentiality and anonymity of the collected information. Participants were assured that any obtained information will be used for the research purpose only.

Statistical design

Data entry and statistical analysis were done using SPSS, version 22.0 statistical software package. Data were presented using descriptive statistics in the form of frequencies and percentages for qualitative variables, and means, standard deviations, and medians for quantitative variables. Cronbach alpha coefficient was calculated to assess the reliability of the developed tools through their internal consistency. Quantitative continuous data were compared using the Krushkal-Wallis test. Spearman rank correlation was used for assessment of the inter-relationships among quantitative variables and ranked ones. In order to identify the independent predictors of self-regulation, multiple linear regression analysis was used, and analysis of variance for the full regression models was done. Statistical significance was considered at p-value <0.05.

Results

Table (1) shows that 53.3% of the study sample were at age group 5 to 6 years, with a Mean±SD equal 4.8±0.7, and 52.7% of them were females. Whereas, 40% of children were last-born children and 40% of them had 2-3 friends. As it obvious, 53.3% of children had sufficient sleeping hours per day and 40% of them were exposing to screens 2-4 hours per day.

Table (1): Demographic characteristics of children in the intervention study sample (n= 150)

Age (in years)	Frequency	Percent
4-<5	80	53.3
5-6	70	46.7
Mean±SD	4.8±0.7	
Gender		
Male	71	47.3
Female	79	52.7
Birth order		
First	50	33.3
Middle	40	26.7
Last	60	40
No. of friends		
1	35	23.3
2-3	60	40
4+	55	36.7
Sleeping hours		
Sufficient	80	53.3
Insufficient	70	46.7
Screen-time exposure		
1-2 hrs	45	30
2-4 hrs	60	40
4+ hrs	45	30

Figure (1): reveals distribution of impulsivity among children in the study sample. it illustrates that 33.3% of children in the total study sample were impulsive, while 31.3% of them were reflective, 19.33% of them were slow inaccurate, and 16% of them were fast accurate.

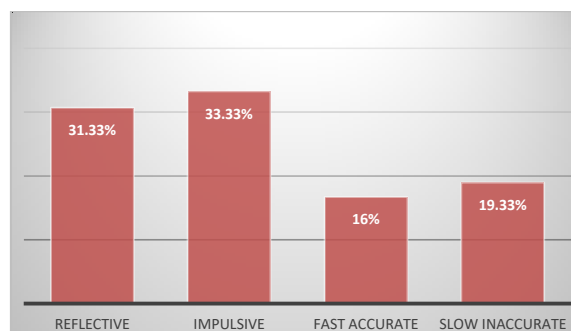


Figure (1): Distribution of children in the study sample according to matching familiar figures test (N=150)

Table (2): Demonstrates self-regulation skills among children in the study sample. Nearly 50% had deficient executive function and emotional regulation respectively.

Table 2: Self-regulation skills among children in the study sample (n=150)

Items	Frequency	Percent
Self-regulation skills:		
Executive function regulation:		
High	73	48.7
Deficient	77	51.3
Emotional regulation:		
High	74	49.3
Deficient	76	50.7

Table (3): reveals that highly statistically significant relationship was found between impulsivity and self-regulation skills. It was noticed that children with impulsivity showed less efficiency of executive function and emotional regulation skills ($p < 0.001$).

Table 3: Relations between impulsivity and self-regulation skills among children in the study sample (n=150)

	Impulsive	Neither	Reflective	Kruskal Wallis test	p-value
Executive function regulation	19.6±3.7	23.5±4.7	27.3±1.9	57.10	<0.001**
Emotional regulation	21.6±4.3	26.5±4.8	30.5±2.0	50.81	<0.001**

**Highly statistically significant ($p < 0.001$)

Table (4): displays that study sample's age, father education, mother education, income, and sleeping hours had statistically significant positive correlation with their self-regulation scores ($r = .195, .182, .231, .273$ and $.247$) respectively. While, screen-time exposure had negative correlation with this score ($r = -.236$). Regarding impulsivity score, this score had statistically significant negative correlation with father education, mother education and sleeping hours ($r = -.145, -.201$ and $-.452$,) respectively. Meanwhile, screen-time exposure had statistically significant positive correlation with impulsivity score ($r = .324$).

Table (4): Correlations between study sample's scores of impulsivity and their demographic characteristics

Items	Spearman's Rank Correlation Coefficient	
	Self-regulation	Impulsivity
Age	.195*	-.102
Birth order	.061	.021
No of friends	.091	-.022
Father education	.182*	-.145*
Mother education	.231**	-.201**
Mother age	.025	.026
Income	.273*	-.153
Sleeping hours	.247**	-.452**
Screen-time exposure	-.236**	.324**

*Statistically significant at $p < 0.05$

Table (5): represents best fitting multiple linear regression models for children's self-regulation score. It indicates that age, female gender, and income were statistically significant independent positive predictors of self-regulation score, while, mother working and impulsivity were statistically significant independent negative predictors of self-regulation score. The model explains that 54% of self-regulation scores as shown by the value of r-square.

Table (5): Best fitting multiple linear regression model for self-regulation score

Items	Unstandardized Coefficients		Standardized Coefficients	t-test	p-value
	B	Std. Error			
Age	-.521	.217	-.569	-2.407	.018*
Female gender	2.248	.725	.206	3.100	.002**
Income	.694	.361	.187	1.931	.012*
Mother working	-.404	.235	-.323	3.142	.005*v*
Impulsivity	-3.795	.887	-.338	-4.278	.001**

R-square=0.499

Discussion

The present study findings revealed that one third of children in the total study sample were impulsive. This might be due to inappropriate discipline, neglecting of caregivers, lack of sleeping hours and attention, and prolonged screen-time exposure which intensify signs of impulsivity. Similarly, in Ghana, Nkrumah et al. [8] revealed that 37% of preschool children were impulsive. In relation to self-regulation skills, the present study finding clarified that around half of the study sample had deficient executive function and emotional regulation. This result might be due to lack of experiences, support and encouragement that help preschoolers to self-regulate. In Indonesia, this finding was in accordance with Widiastuti [9] who revealed that preschool children hadn't been able to control their emotions and behaviors. The present study results indicated that highly statistically significant relationship was found between impulsivity and self-regulation skills. Children with impulsivity showed less efficiency of executive function and emotional regulation skills. This might be contributed to the fact that self-regulation and impulsivity share common neurobiological underpinnings (e.g., activity of ventromedial prefrontal cortex). Similarly, Garofalo et al. [10] in USA concluded that impairments in self-regulation were found to be significantly correlated to high levels of impulsivity among young children. Concerning age, the current study findings showed that statistically significant positive correlation between children's age and their self-regulation scores, i.e. older children have better self-regulation abilities. This finding might be attributed to the known fact that older children have more developed cognitive skills such as planning and self-initiated behaviors required to utilize their new self-regulation skills. This result is supported by Rosanbalm and Murray [1] in United States, who revealed that younger children had more difficulty than older children with self-regulation (coping and adapting). The present study findings illustrated that statistically significant positive correlation was found between parents' education and children's self-regulation scores, as children of high educated parents showed better self-regulation scores. This result might be due to that level of education influences parents' knowledge, beliefs, values, and goals about childrearing. For example, higher levels of education enable parents to acquire and model social skills and problem-solving strategies conducive to children's self-regulation development. In United States, this finding is in alignment with Pears et al. [11] who emphasized that there was a significant positive relationship between parents' education and children's self-regulation during preschool years. The current study results showed that there was a statistically significant positive correlation between children's sleeping hours and their self-regulation scores. It indicated that children with sufficient sleeping hours (10-12) hours per day including naps had better self-regulation scores. This finding might be contributed to the fact that during sleep, memories are consolidated, unnecessary synaptic connections established during the daytime are pruned, and the neural networks supporting sustained attention are maintained, contributing to better cognitive function and emotion regulation. This finding was in the same context with Nathanson & Beyens [12] in USA, who concluded that better self-regulation skills were positively related to children who slept longer at night. The present study findings also clarified that there was a statistically significant negative correlation between screen-time exposure and children's self-regulation scores. It was noticed that limiting screen time exposure less than 2 hours per day associated with better self-regulation scores. This finding might be contributed to the fact that children expose to the hyper arousing screens at a

younger age can be detrimental in their brain development as their brains are not ready to handle the over stimulation. So, children are not able to focus and remain in a calm state during instruction. This finding is in the same line with Hopkins [13] who mentioned that biological stress, prolonged screen exposure and lack of sleep lead to poor self-regulation. Regarding parents' education, the present study findings revealed that there was a statistically significant negative correlation between parents' education and children's impulsivity score. It indicated that children of high educated parents had low impulsivity scores. The rationale of this phenomenon might be due to that high educated parents give more attention to their children, display more abilities to use effective discipline strategies, engage their children in intellectual activities, and generally have children with fewer behavioral problems. In Indonesia, this finding was in alignment with Purwati and Japar [14], who mentioned that behavioral problems such as impulsivity were more commonly found in families with lower incomes and lower education levels. Concerning sleeping hours, the current study results showed that there was a statistically significant negative correlation between sleeping hours and children's impulsivity scores. It was noticed that children with insufficient sleeping hours had high impulsivity scores. This finding might be due to that poor sleep increases emotional reactivity which in turn worsens impulse control. In the same line, Lwandowski et al. [15], in Washington, found that children who experienced sleep problems also experienced increased difficulties with impulse control, and problems regulating impulses. Regarding screen-time exposure, the current study findings revealed that statistically significant positive correlation was found between screen-time exposure and impulsivity. It indicated that prolonged screen time exposure associated with high impulsivity. This finding might be due to that too much screen exposure affects brain which in turn leads to problems of attention and concentration, and acting with impulsivity. In Italy, this finding is in agreement with Tamana et al. [16], who revealed that increased screen-time in pre-school is associated with worse inattention and behavioral problems. Concerning gender, the present study findings illustrated that female children had better self-regulation scores than males with statistically significant difference. This finding might be contributed to the fact that gender differences likely reflect societal expectations. Females are subjected to higher levels of parental supervision than males and are more likely to be reprimanded for deviant behaviors. In United States, this finding is in agreement with Hong et al. [17], who found that girls, as compared to boys, were generally better at regulating and managing their attention, inhibiting impulses, and being aware of subtle external changes. Regarding family's income, the present study results clarified that family income was a positive predictor factor of considerable importance in self-regulation skills of children as confirmed in the current study regression model. The study findings clarified that children whose family had sufficient income showed better self-regulation skills. This result might be reflected that Children growing up in moderate to high socio-economic status are less likely to experience chronic stressors in their physical and social environments which interfere the development of brain areas supporting cognitive and emotional regulation. In agreement with this, the study of Li et al. [18], in China, revealed that higher family income was associated with significantly better child cognitive and emotional self-regulation. As for mother's job, the present study findings also showed that working mothers were identified as a significant negative predictor of children's self-regulation scores. This result might be contributed to the fact that working mothers do not have time to spend with their children, and is somehow related to detrimental effects in children's physical, mental, social and psychological development, while, non-working mothers provide proper attention to their children which is the basic requirement for emotional and mental development and social adjustment. On contrary of the aforementioned study result, McGinn et al. [19], in USA, revealed that children of working mothers showed more self-regulation skills and showed higher levels of academic performance than children of housewife mothers. This discrepancy might be attributed to cultural differences in type of work and number of hours.

Conclusion

The study results lead to the conclusion that impulsivity among preschool children is related to poor self-regulation skills, with statistically significant relation.

Recommendations

The study recommended that self-regulation training programs should be implemented to preschool children to enhance impulsivity and deficient self-regulation. Further researches should be developed to address the risk factors of impulsivity and how to manage them.

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