

Data feedback and behavioral change effects of an exclusive personalized intervention on children

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ABSTRACT

Personalized and purposeful intervention has evidently been effective to improve bonding, relationships and behavior. The present study was carried on 889 students studying between 3rd to 8th grade, including 468 girls and 421 males. The primary data included the cognitive factors quantified through an assessment which was conducted to find the intelligence quotient, focus factor, decision making ability and creative quotient of the respondents. Another set of data was collected through an interview to probe into the behaviour pattern of the students. Early intervention can change and rectify the developmental path and improve outcomes for children. That inevitably promotes future success in school. In a nutshell, it was found that the respondents of the experimental group performed well in terms of cognitive factors as well as a better trend was evident in terms of behavioral aspects among respondents in the experimental group after the intervention. The results gave an indication of the benefits of personalized intervention on the cognitive abilities as well as behaviour patterns of children.

Keywords: Confidence, Creative Quotient, Decision Making Ability, Focus Factor, Intelligence Quotient

Childhood is the stage of life which seems to be extremely important by every educationist, researcher and industrialist. There is ample evidence to find out the importance and trace the reliability of this fact. The stage of childhood is quite similar to the state of an empty slate. Whatever inputs are given to the children at this young age, becomes the part of their behaviour. No doubt heredity and environment both equally contribute to the development of children. However, it is an established fact that with the increased use of technology and its advancement at a higher pace, it has become very important for the parents, teachers and educators to realise the importance of this vital stage. There is a need of intentional and interventional change in the behaviour of children as desired to make them society fit. School and formal education is providing them

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opportunities to explore education in a formal way. Provision of a personalized environment to imbibe education and better learning is a justified approach to uplift the educational standard and learning capabilities. Rutter (1985) conducted a research study to analyse the family and school influences on cognitive development of children. It was found that environment of interest and conducive surroundings enhance the cognitive development of children. Ramey and Ramey (1998) studied the prevention of intellectual disabilities through early interventions to improve cognitive development of children. Bilhartz et. al (1999) found the effect of early music training on child cognitive development and reported the positive correlation between the two. Bergen (2002) studied the role of pretend play in cognitive development of children. Van Sluijs et. al (2007) conducted a study to find the effectiveness of interventions to promote the physical intelligence among children. Lubans et. al (2008) carried a review of mediators of behavior in interventions to promote physical activity among children. Burger (2010) found the impact of early childhood care and education on cognitive development of children from different social backgrounds. Shelleby and Shaw (2014) found the outcomes of parenting interventions for child conduct problems. Bann et. al (2016) studied a home-based early intervention and the influence of family resources on cognitive development of children. Ng and Weisz (2016) highlighted the importance of a science of personalized intervention for the mental abilities and mental health of students. Obradovic et. al (2016) studied the impact of maternal scaffolding and home stimulation as the key mediators of early intervention to find their positive influence on the cognitive development of children. Scott (2016) evaluated that the best way to tailor the mental and cognitive capabilities of children was to imbibe in them the educative content through psychological interventions. Ng and Weisz (2018) studied and found the impact of the personalized intervention on cognitive as well as non-cognitive abilities of children. Doss et. al (2019) explained the vital importance of differentiated and personalized messages and signals to parents for development. Meier and Davis (2019) highlighted the importance of the elements of counseling and personalized environment. Williams and Beidas (2019) studied the importance of science in child psychology. Alp and Top (2020) carried an investigation of the relation between the level of motor skills and the quality of life among children. Cahill and Beisbier (2020) studied and emphasized the occupational therapy practice guidelines for children. Chaparro et. al (2020) studied the early childhood care and cognitive development. Dankiw et. al (2020) studied the impacts of unstructured nature play on health in early childhood development and found the positive outcome. Drago et. al (2020) emphasized the psychosocial and environmental determinants of cognitive development among children. Keizer et. al (2020) found that the fathers and mothers have the equal influence on the child's personality and cognitive development. So, they ought to share childcare responsibilities on children's cognitive development from early childhood to school age. Lee et. al (2020) studied the effects of a fundamental motor skill-based afterschool program on children's physical and cognitive health outcomes and found a highly positive correlation. Norris et. al (2020) highlighted the importance of physically active lessons in schools and their impact on physical activity, educational, health and cognitive development of children. Peralbo-Uzquiano et. al (2020) evaluated the positive effects of a virtual intervention programme on cognitive flexibility, inhibitory control and basic math skills in childhood education. Schmidt et. al (2020) carried a research study and combined physical and cognitive training to improve kindergarten children's executive functions. Taverna et. al (2020) described benefits of an intervention program on foundational skills for kindergarten children and first graders. Wilson and Barnett (2020) emphasized the importance of physical activity interventions for children and adolescents. Wu et. al (2020) established the relationship between motor fitness, fundamental movement skills, and functional movement screen in primary school children. Zhang et. al (2020)

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described the role of psychosocial factors in predicting students' achievement outcomes. Foley et. Al (2021) studied the effects of the active kids voucher intervention program on children and adolescents' physical activity in form of a natural experiment. Laverdure and Beisbier (2021) highlighted the importance of occupation and activity-based interventions to improve performance of activities of daily living, play and leisure for children and youth aging between 5 to 21years. Logan et. al (2021) studied the differential relationship of an afterschool physical activity intervention on brain function and cognitive development of children. Thus, the present study was conducted to assess the data feedback and behavioral change effects of an exclusive personalized intervention on children. The data feedback was taken from the parents of the students through which the behavioral changes were recorded.

METHODOLOGY

An intervention study requires the presence of both control group and experimental group for the better expression of result and analysis of data. Thus, to find the impact it was important to carry study with two groups. This study was conducted on a sample of 889 students between 3rd to 8th grade, out of whom 468 were girls and 421 were male respondents. The primary cognitive data of the students were collected through the assessment while questionnaire was used to probe into the behaviour patterns of these respondents. The primary data included the cognitive factors quantified through an assessment which was conducted to find the intelligence quotient, focus factor, decision making ability and creative quotient of the respondents. Another set of data was collected through an interview to probe into the behaviour pattern of the students. Feedback was taken on showing self-confidence, enjoying daily routine, bonding with mother, bonding with father, receiving appreciation from others, extra-curricular participation, interest in homework, interest in studies, feedback on excessive television viewing and excessive mobile phone usage. It was ensured to have the best possibility of availability of students and their parents during the interview session. All the interview sessions were conducted online and telephonically. Due care was taken not to miss important information to get the reliable data. Initially the pre assessment was conducted following which an intervention was given for 3 months, another test, termed as test 2 was conducted after the intervention was completed for three months. The next phase included another replica intervention for next 3 months following another assessment termed as test 3. The process continued with another intervention of 3 months, followed by test 4 eventually with the final round of intervention of 3 months. Finally, post test was conducted. Assessment and tests were conducted for all the respondents where as the intervention was given only to the experimental group. However, the interview was conducted on both groups twice during pre-assessment and after post-assessment. The intervention was given in terms of a digital platform which included worksheets, weekly activities, talent activities and recommendations in the form of movies, books and games. A digital platform in the form of monthly competition was also offered to the respondents. Regular attempt and performance were tracked by the investigators.

RESULT AND DISCUSSION

The data was collected, organised and analysed for further processing. It is clear from table 1 that the average IQ of respondents in the control group was 108.9 in the pre test, which remained stable till the end. In contrast, the IQ of the respondents in the experimental group rose significantly at the end. The dynamic intelligence quotient of respondents in control group was initially 108.9 in the pre test. However, values were found to be 108.9 in test-2, which further became 109.1 in test-3 before approaching at 109 in test-4. Later in post test, the value of dynamic intelligence quotient became 109.3. However, the dynamic

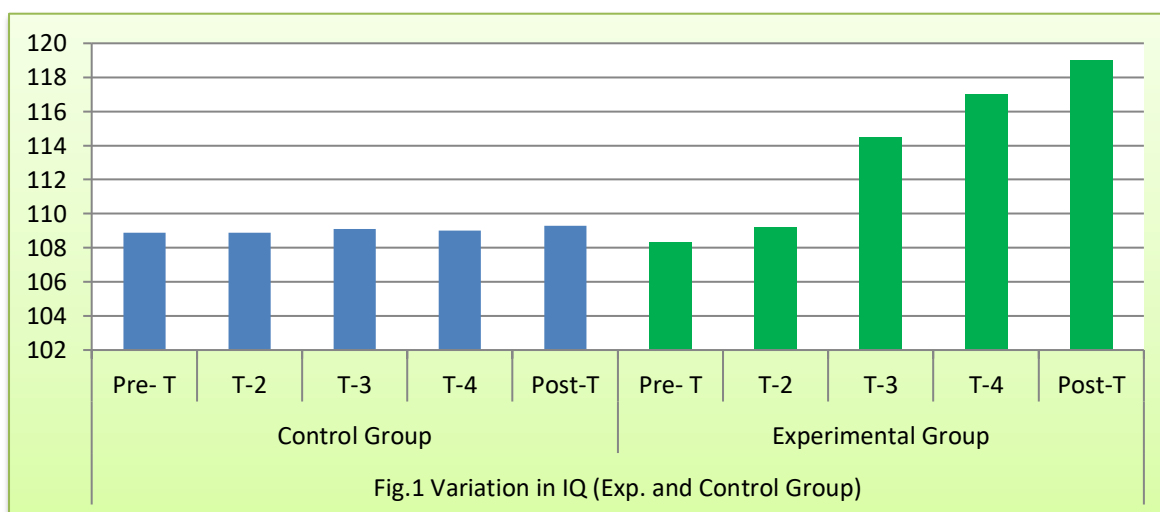
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intelligence quotient of respondents in experimental group was initially 108.3 in the pre test. However, values were found to be 109.2 in test-2, which further became 114.5 in test-3 before approaching at 117 in test-4. Later in post test, the value of dynamic intelligence quotient became 119.

Table 1: Variation in IQ (Exp. and Control Group)

Control Group					Experimental Group				
Pre- T	T-2	T-3	T-4	Post-T	Pre- T	T-2	T-3	T-4	Post-T
108.9	109	109	109	109.3	108.3	109	115	117	119

The focus factor of respondents in control group was initially 84.9 in the pre test. However, values were found to be 83.7 in test-2, which further became 84 in test-3 before approaching at 84.5 in test-4. Later in post test, the value of focus factor became 84. However, the focus factor of respondents in experimental group was initially 84.3 in the pre test.



However, values were found to be 89.6 in test-2, which further became 94 in test-3 before approaching at 96 in test-4. Later in post test, the value of focus factor became 99. It is clear from table 2 that the average focus factor of respondents in the control group was almost unchanged till the end. In contrast the focus of the respondents in the experimental group rose significantly at the end.

Table 2: Variation in FF (Exp. and Control Group)

Control Group					Experimental Group				
Pre- T	T-2	T-3	T-4	Post-T	Pre- T	T-2	T-3	T-4	Post-T
84.9	83.7	84	85	84	84.3	89.6	94	96	99

It is clear from table 3 that the average DMA of respondents in the control group remained similar till the end. In contrast the DMA of the respondents in the experimental group rose significantly at the end. The decision-making ability of respondents in control group was initially 0.56 in the pre test. However, values were found to be 0.51 in test-2, which further became 0.53 in test-3 before approaching at 0.53 in test-4.

Later in post test, the value of decision-making ability became 0.51. However, the decision-making ability of respondents in experimental group was initially 0.5 in the pre test. However, values were found to be 0.61 in test-2, which further became 0.69 in test-3 before

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approaching at 0.7 in test-4. Later in post test, the value of decision-making ability became 0.74.

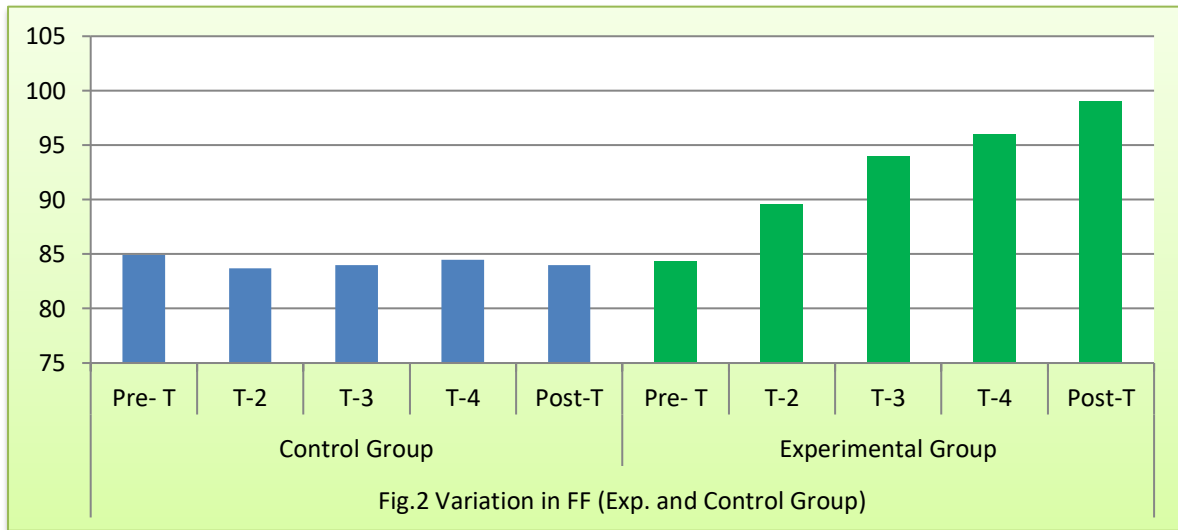
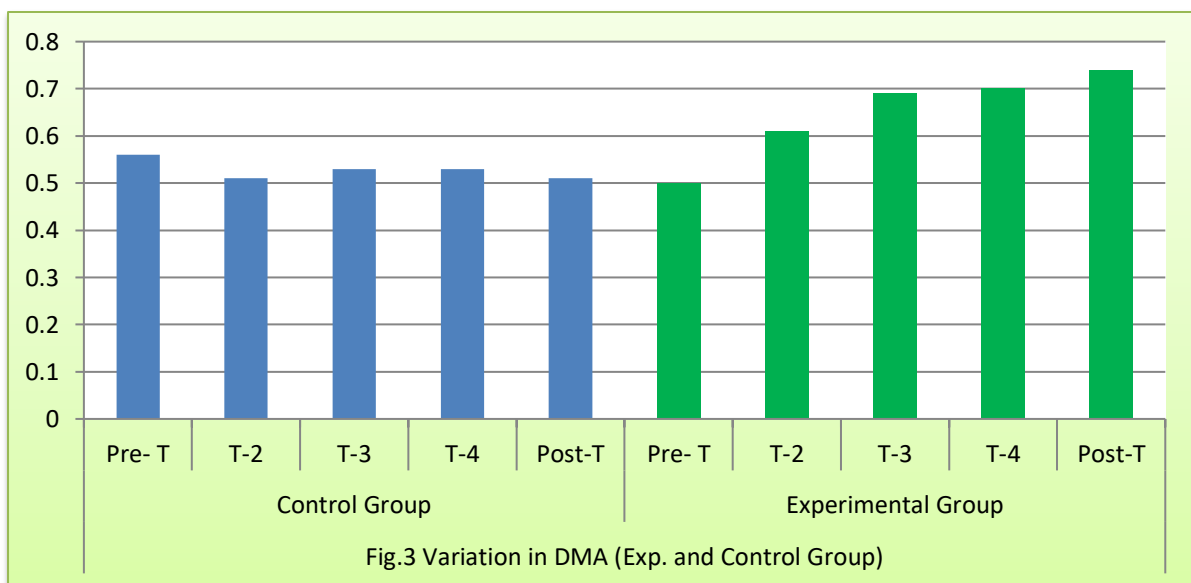


Table 3: Variation in DMA (Exp. and Control Group)

Control Group					Experimental Group				
Pre- T	T-2	T-3	T-4	Post-T	Pre- T	T-2	T-3	T-4	Post-T
0.56	0.51	0.53	0.5	0.51	0.5	0.61	0.69	0.7	0.74



The creative quotient of respondents in control group was initially 0.48 in the pre test. However, values were found to be 0.47 in test-2, which further became 0.5 in test-3 before approaching at 0.49 in test-4. Later in post test, the value of creative quotient became 0.49. However, the creative quotient of respondents in experimental group was initially 0.47 in the pre test. However, values were found to be 0.56 in test-2, which further became 0.61 in test-3 before approaching at 0.68 in test-4. Later in post test, the value of creative quotient became 0.84.

Table 4: Variation in CQ (Exp. and Control Group)

Control Group					Experimental Group				
Pre- T	T-2	T-3	T-4	Post-T	Pre- T	T-2	T-3	T-4	Post-T
0.48	0.47	0.5	0.5	0.49	0.47	0.56	0.61	0.7	0.84

It is clear from table 4 that the average CQ of respondents in the control group changed insignificantly till the end. In contrast the CQ of the respondents in the experimental group rose significantly at the end.

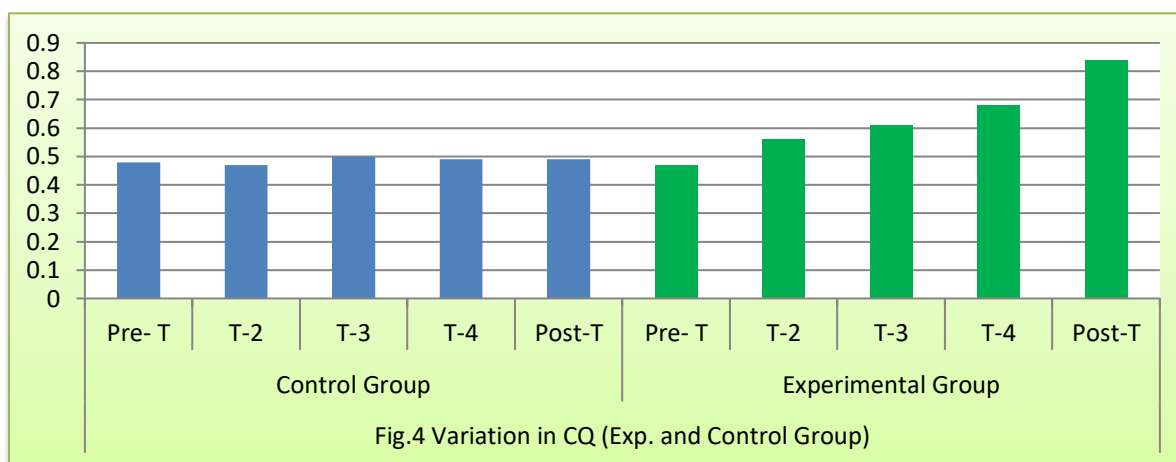


Figure 5 shows that 14% of respondents in control group had shown self-confidence frequently as responded during the pre-survey. However, during the post survey, this figure was found to be 16%. 15% of respondents in control group had shown self-confidence often, as responded during the pre survey. But during the post survey, this figure was found to be 16%. 71% of respondents in control group had shown self-confidence not at all, as responded during the pre survey while during the post survey, this figure was found to be 68%.

Table 5: Feedback on Showing Self Confidence

Groups	Control Group		Experimental Group	
	Pre-Survey	Post-Survey	Pre-Survey	Post-Survey
Frequent	14	16	15	68
Often	15	16	12	15
Never	71	68	73	17

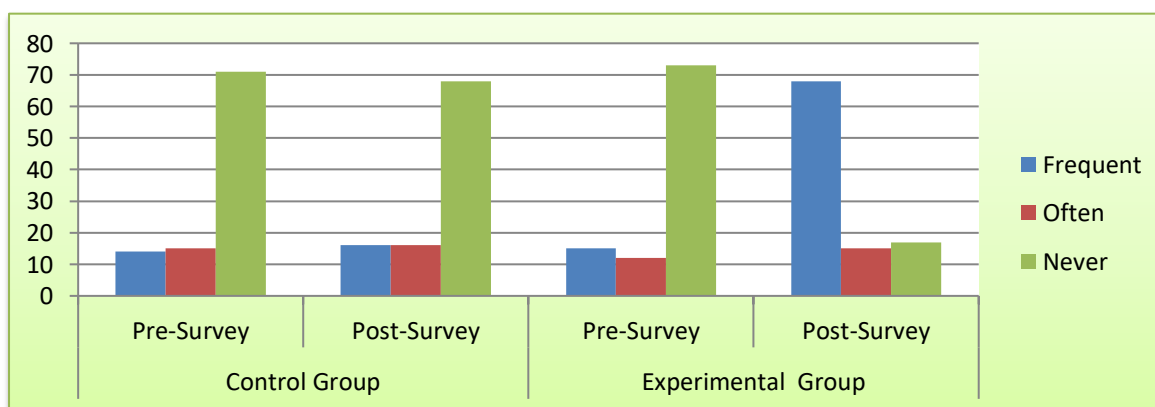


Fig. 5: Feedback on Showing Self Confidence

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On the contrary, in case of experimental group, 15% of respondents had shown self confidence frequently as responded during the pre survey. However during the post survey, this figure was found to be 68%. 12% of respondents had shown self-confidence often, as responded during the pre survey. But during the post survey, this figure was found to be 15%. 73% of respondents had shown self-confidence not at all, as responded during the pre survey while during the post survey, this figure was found to be 17%.

Table 6: Feedback on Enjoying Daily Routine

Groups	Control Group		Experimental Group	
	Pre-Survey	Post-Survey	Pre-Survey	Post-Survey
Frequent	13	15	14	64
Often	16	15	11	15
Never	71	70	75	21

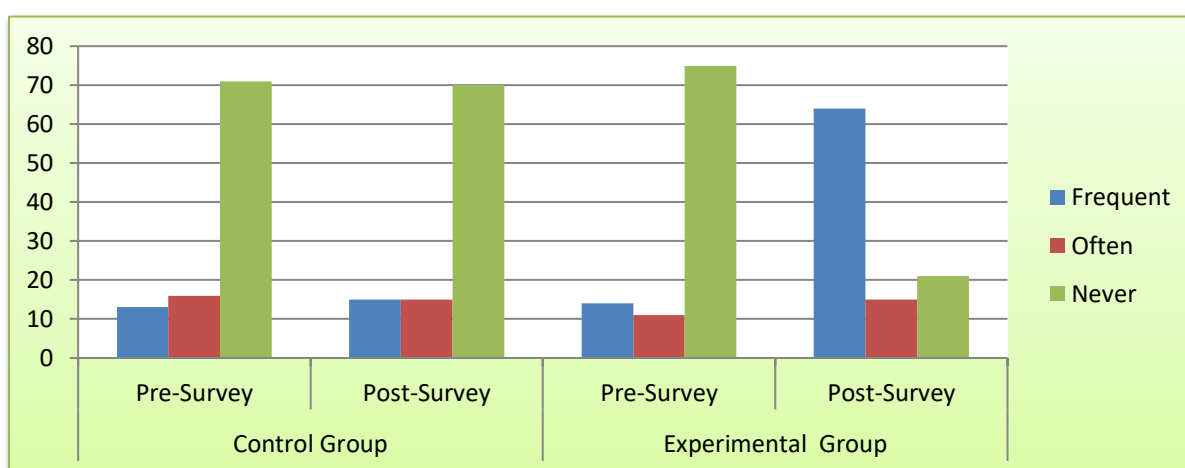


Fig. 6: Feedback on Enjoying Daily Routine

Table 6 shows that 13% of respondents in control group enjoyed daily routine frequently as responded during the pre survey. However, during the post survey, this figure was found to be 15%. 16% of respondents in control group enjoyed daily routine often, as responded during the pre survey. But during the post survey, this figure was found to be 15%. 71% of respondents in control group enjoyed daily routine not at all, as responded during the pre survey while during the post survey, this figure was found to be 70%. On the contrary, in case of experimental group, 14% of respondents enjoyed daily routine frequently as responded during the pre survey. However, during the post survey, this figure was found to be 64%. 11% of respondents enjoyed daily routine often, as responded during the pre survey. But during the post survey, this figure was found to be 15%. 75% of respondents enjoyed daily routine not at all, as responded during the pre-survey while during the post survey, this figure was found to be 21%.

Table 7: Feedback on Enjoying Bonding with Mother

Groups	Control Group		Experimental Group	
	Pre-Survey	Post-Survey	Pre-Survey	Post-Survey
Frequent	15	17	16	71
Often	18	17	13	29
Never	67	66	71	0

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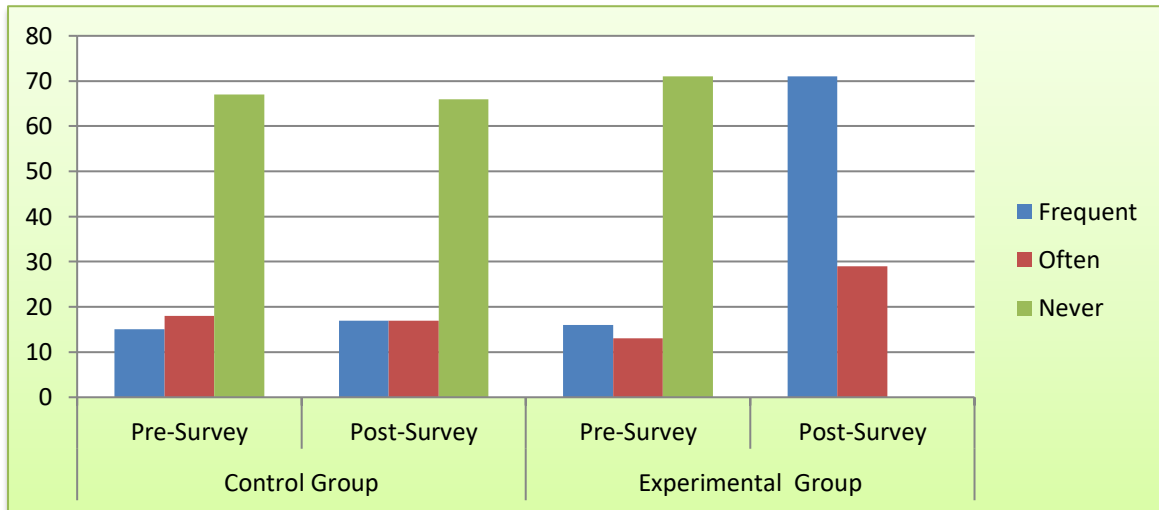


Fig. 7: Feedback on Enjoying Bonding with Mother

It is revealed that 15% of respondents in control group enjoyed bonding with mothers frequently as responded during the pre-survey. However, during the post survey, this figure was found to be 17%. 18% of respondents in control group enjoyed bonding with mothers often, as responded during the pre-survey. But during the post survey, this figure was found to be 17%. 67% of respondents in control group enjoyed bonding with mothers not at all, as responded during the pre-survey while during the post survey, this figure was found to be 66%. On the contrary, in case of experimental group, 16% of respondents enjoyed bonding with mothers frequently as responded during the pre-survey. However, during the post survey, this figure was found to be 71%. 13% of respondents enjoyed bonding with mothers often, as responded during the pre-survey. But during the post survey, this figure was found to be 29%. 71% of respondents enjoyed bonding with mothers not at all, as responded during the pre-survey while during the post survey, this figure was found to be nil.

Table 8: Feedback on Enjoying Bonding with Father

Groups	Control Group		Experimental Group	
	Pre-Survey	Post-Survey	Pre-Survey	Post-Survey
Frequent	10	9	18	69
Often	11	12	28	27
Never	79	79	54	4

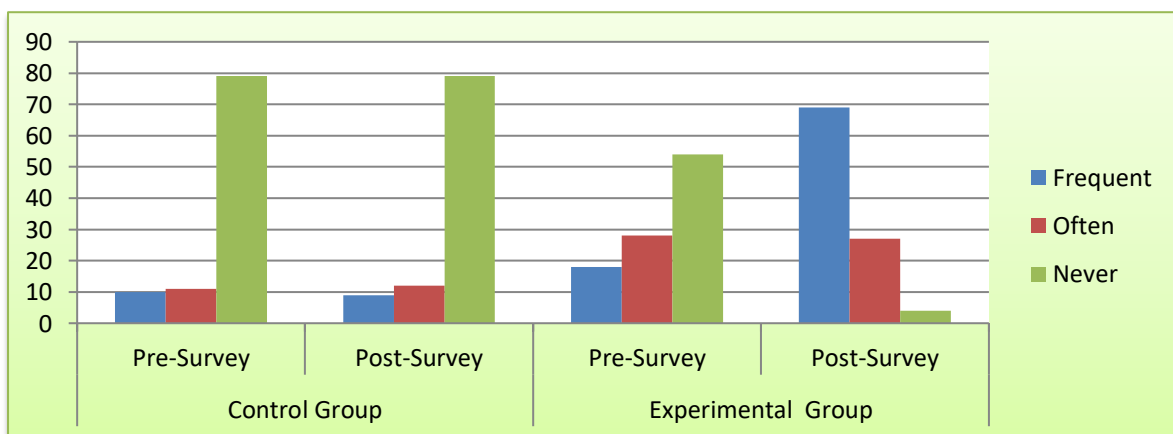


Fig. 8: Feedback on Enjoying Bonding with Father

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It is revealed that 10% of respondents in control group enjoyed bonding with fathers frequently as responded during the pre survey. However, during the post survey, this figure was found to be 9%. 11% of respondents in control group enjoyed bonding with fathers often, as responded during the pre survey. But during the post survey, this figure was found to be 12%. 79% of respondents in control group enjoyed bonding with fathers not at all, as responded during the pre survey while during the post survey, this figure was found to be 79%. On the contrary, in case of experimental group, 18% of respondents enjoyed bonding with fathers frequently as responded during the pre survey. However, during the post survey, this figure was found to be 69%. 28% of respondents enjoyed bonding with fathers often, as responded during the pre survey. But during the post survey, this figure was found to be 27%. 54% of respondents enjoyed bonding with fathers not at all, as responded during the pre survey while during the post survey, this figure was found to be 4%.

Table 9: Feedback on Receiving Appreciation from Others

Groups	Control Group		Experimental Group	
	Pre-Survey	Post-Survey	Pre-Survey	Post-Survey
Frequent	7	7	18	70
Often	16	16	28	29
Never	77	77	54	1

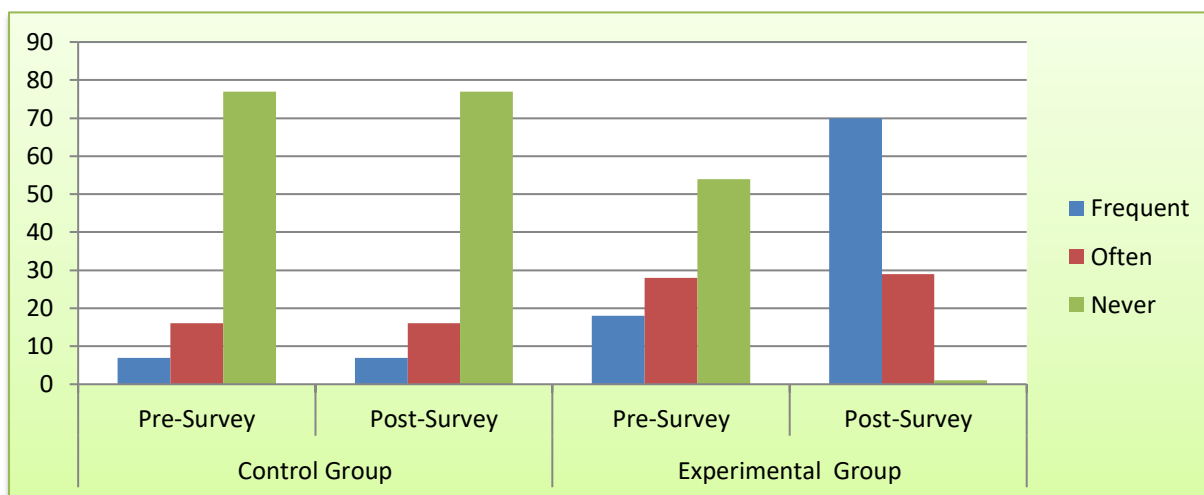


Fig.9: Feedback on Receiving Appreciation from Others

It is revealed that 7% of respondents in control group had received appreciation from others frequently as responded during the pre survey. However during the post survey, this figure was found to be 7%. 16% of respondents in control group had received appreciation from others often, as responded during the pre survey. But during the post survey, this figure was found to be 16%. 77% of respondents in control group had received appreciation from others not at all, as responded during the pre survey while during the post survey, this figure was found to be 77%. On the contrary, in case of experimental group, 18% of respondents had received appreciation from others frequently as responded during the pre survey. However during the post survey, this figure was found to be 70%. 28% of respondents had received appreciation from others often, as responded during the pre survey. But during the post survey, this figure was found to be 29%. 54% of respondents had received appreciation from others not at all, as responded during the pre survey while during the post survey, this figure was found to be 1%.

Table 10: Feedback on Extra-curricular Participation

Groups	Control Group		Experimental Group	
	Pre-Survey	Post-Survey	Pre-Survey	Post-Survey
Frequent	12	13	16	70
Often	18	13	19	19
Never	70	74	65	11

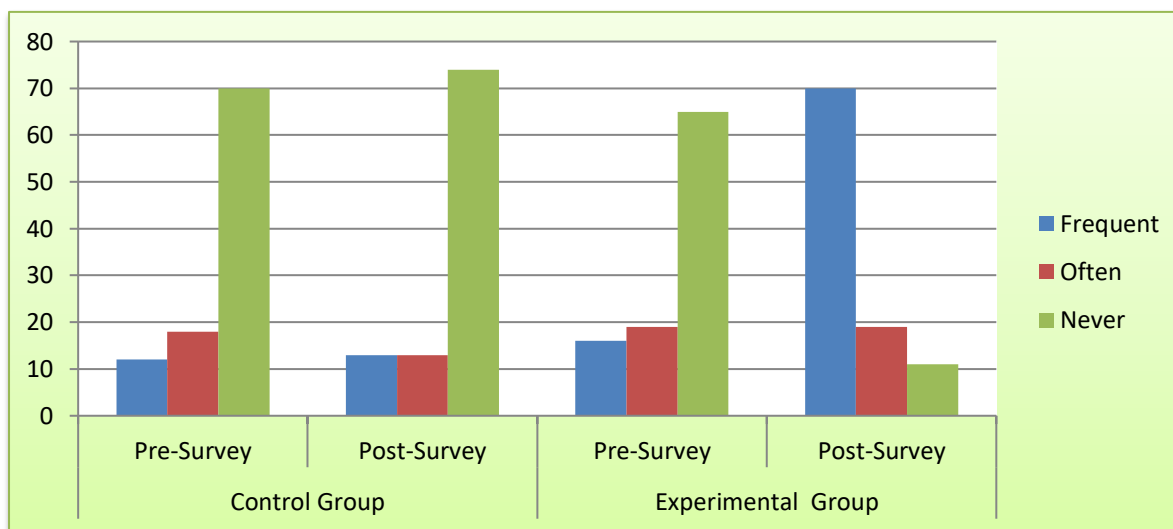


Fig. 10: Feedback on Extra-curricular Participation

It is revealed that 12% of respondents in control group actively participated in extra curricular activities frequently as responded during the pre survey. However, during the post survey, this figure was found to be 13%. 18% of respondents in control group actively participated in extra curricular activities often, as responded during the pre survey. But during the post survey, this figure was found to be 13%. 70% of respondents in control group actively participated in extracurricular activities not at all, as responded during the pre survey while during the post survey, this figure was found to be 74%. On the contrary, in case of experimental group, 16% of respondents actively participated in extra curricular activities frequently as responded during the pre survey. However, during the post survey, this figure was found to be 70%. 19% of respondents actively participated in extra curricular activities often, as responded during the pre survey. But during the post survey, this figure was found to be 19%. 65% of respondents actively participated in extra curricular activities not at all, as responded during the pre survey while during the post survey, this figure was found to be 11%.

Table 11: Feedback on Interest in Homework

Groups	Control Group		Experimental Group	
	Pre-Survey	Post-Survey	Pre-Survey	Post-Survey
Frequent	28	28	27	78
Often	9	9	12	15
Never	63	63	61	7

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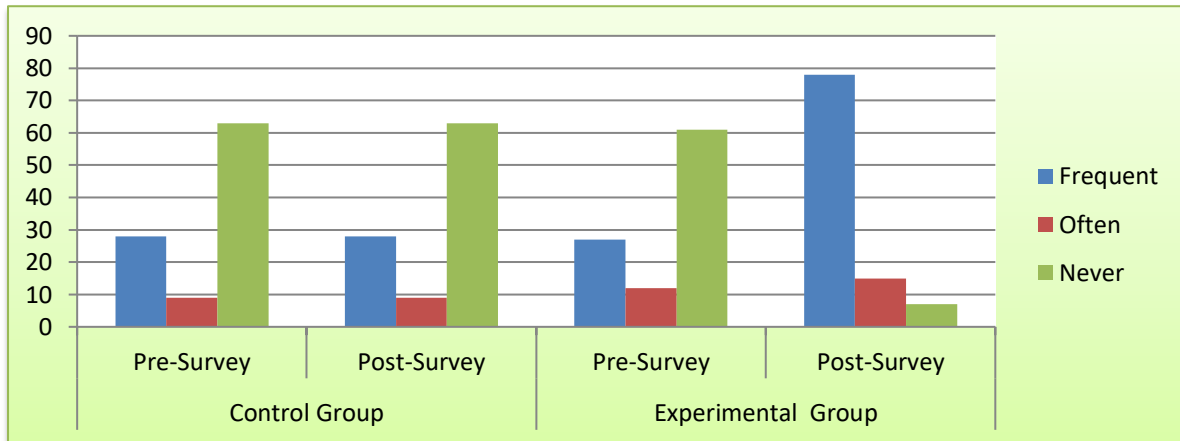


Fig. 11: Feedback on Interest in Homework

It is revealed that 28% of respondents in control group had shown interest in homework frequently as responded during the pre survey. However during the post survey, this figure was found to be 28%. 9% of respondents in control group had shown interest in homework often, as responded during the pre survey. But during the post survey, this figure was found to be 9%. 63% of respondents in control group had shown interest in homework not at all, as responded during the pre survey while during the post survey, this figure was found to be 63%. On the contrary, in case of experimental group, 27% of respondents had shown interest in homework frequently as responded during the pre survey. However during the post survey, this figure was found to be 78%. 12% of respondents had shown interest in homework often, as responded during the pre survey. But during the post survey, this figure was found to be 15%. 61% of respondents had shown interest in homework not at all, as responded during the pre survey while during the post survey, this figure was found to be 7%.

Table 12: Feedback on Interest in Studies

Groups	Control Group		Experimental Group	
	Pre-Survey	Post-Survey	Pre-Survey	Post-Survey
Frequent	14	14	15	78
Often	20	20	10	18
Never	66	66	75	4

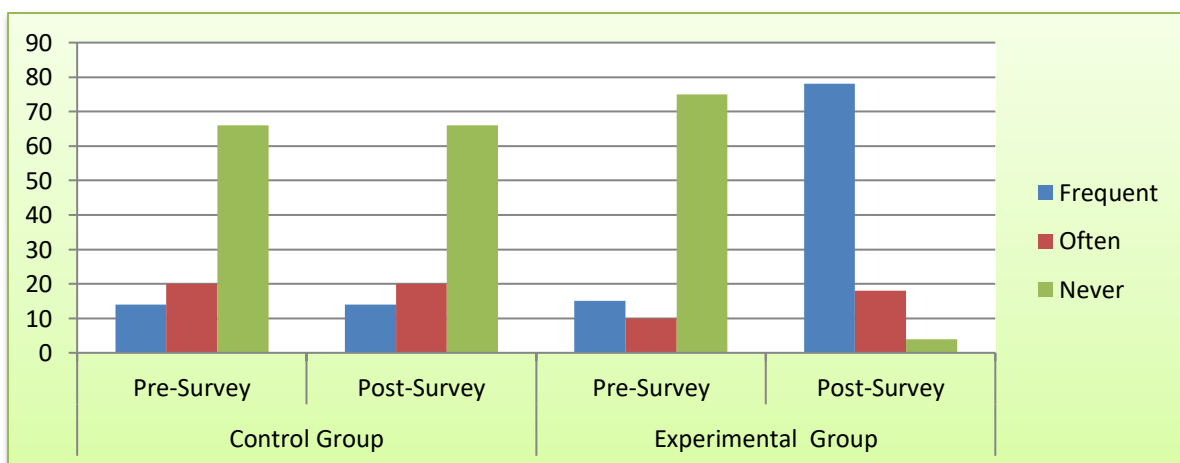


Fig. 12: Feedback on Interest in Studies

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It is revealed that 14% of respondents in control group had shown interest in studies frequently as responded during the pre survey. However during the post survey, this figure was found to be 14%. 20% of respondents in control group had shown interest in studies often, as responded during the pre survey. But during the post survey, this figure was found to be 20%. 66% of respondents in control group had shown interest in studies not at all, as responded during the pre survey while during the post survey, this figure was found to be 66%. On the contrary, in case of experimental group, 15% of respondents had shown interest in studies frequently as responded during the pre survey. However during the post survey, this figure was found to be 78%. 10% of respondents had shown interest in studies often, as responded during the pre survey. But during the post survey, this figure was found to be 18%. 75% of respondents had shown interest in studies not at all, as responded during the pre survey while during the post survey, this figure was found to be 4%.

Table 13: Feedback on Excessive Television Viewing

Groups	Control Group		Experimental Group	
	Pre-Survey	Post-Survey	Pre-Survey	Post-Survey
Frequent	64	64	68	10
Often	22	23	15	16
Never	14	13	17	74

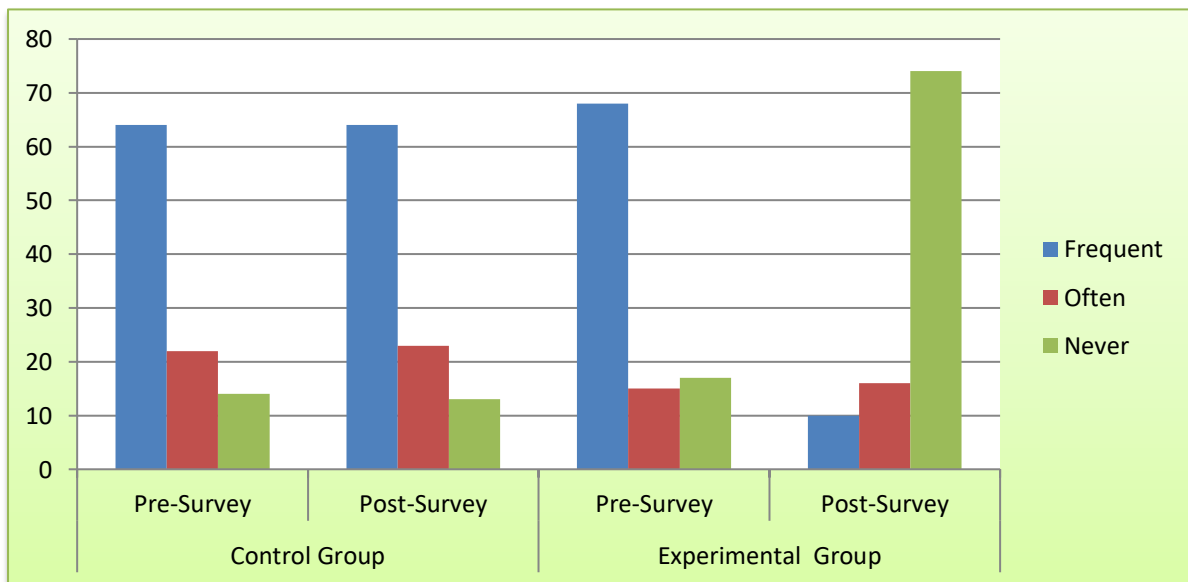


Fig. 13: Feedback on Excessive Television Viewing

It is revealed that 64% of respondents in control group viewed television excessively frequently as responded during the pre survey. However during the post survey, this figure was found to be 64%. 22% of respondents in control group viewed television excessively often, as responded during the pre survey. But during the post survey, this figure was found to be 23%. 14% of respondents in control group viewed television excessively not at all, as responded during the pre survey while during the post survey, this figure was found to be 13%. On the contrary, in case of experimental group, 68% of respondents viewed television excessively frequently as responded during the pre survey. However during the post survey, this figure was found to be 10%. 15% of respondents viewed television excessively often, as responded during the pre survey. But during the post survey, this figure was found to be 18%. 75% of respondents had shown interest in studies not at all, as responded during the pre survey while during the post survey, this figure was found to be 4%.

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16%. 17% of respondents viewed television excessively not at all, as responded during the pre survey while during the post survey, this figure was found to be 74%.

Table 14: Feedback on Excessive Mobile Phone Usage

Groups	Control Group		Experimental Group	
	Pre-Survey	Post-Survey	Pre-Survey	Post-Survey
Frequent	69	69	70	9
Often	22	23	15	19
Never	9	8	15	72

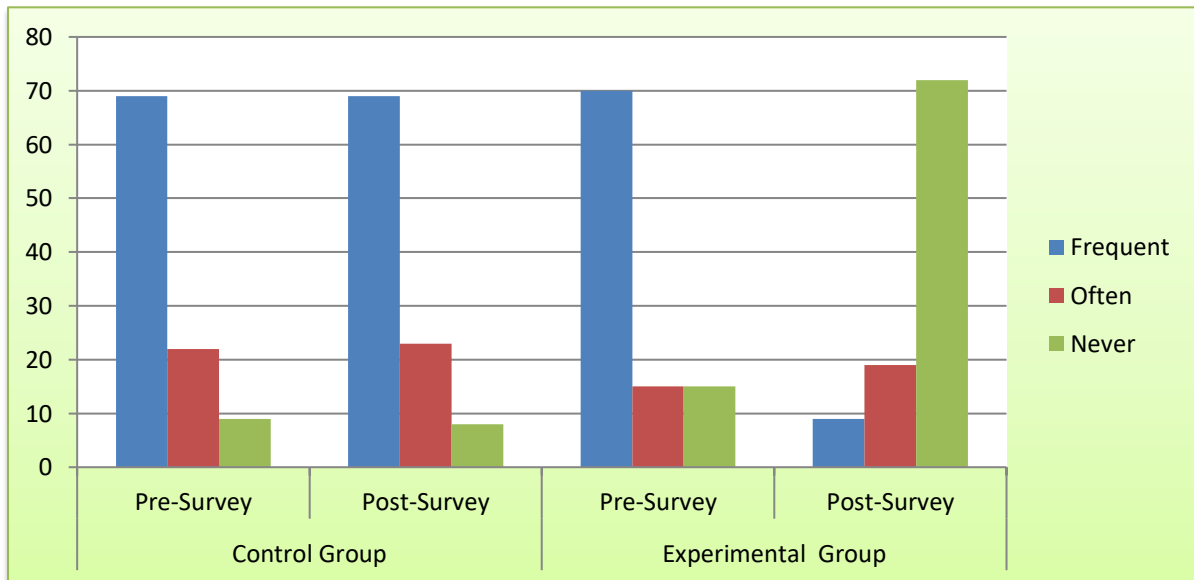


Fig. 14: Feedback on Excessive Mobile Phone Usage

It can be seen that 69% of respondents in control group used mobile excessively frequently as responded during the pre survey. However during the post survey, this figure was found to be 69%. 22% of respondents in control group used mobile excessively often, as responded during the pre survey. But during the post survey, this figure was found to be 23%. 9% of respondents in control group used mobile excessively not at all, as responded during the pre survey while during the post survey, this figure was found to be 8%. On the contrary, in case of experimental group, 70% of respondents used mobile excessively frequently as responded during the pre survey. However during the post survey, this figure was found to be 9%. 15% of respondents used mobile excessively often, as responded during the pre survey. But during the post survey, this figure was found to be 19%. 15% of respondents used mobile excessively not at all, as responded during the pre survey while during the post survey, this figure was found to be 72%.

CONCLUSION

To summarise, it was effectively seen that the respondents of the experimental group performed well in terms of cognitive factors which was concluded after finding out the elevated values of IQ, focus, DMA and creative quotient after intervention. In contrast it was found that there was minimal change in this value among the respondents of control group who were not offered any sort of intervention. A similar trend was seen in terms of behavioral aspects among both the groups with the experimental group at advantage and better patterns after intervention.

REFERENCES

- Alp, B., & Top, E. (2020). Investigation of the Relation between the Level of Motor Skills and the Quality of Life in Turkish Children. *JTRM in Kinesiology*.
- Bann, C. M., Wallander, J. L., Do, B., Thorsten, V., Pasha, O., Biasini, F. J., ... & Carlo, W. A. (2016). Home-based early intervention and the influence of family resources on cognitive development. *Pediatrics, 137*(4).
- Bergen, D. (2002). The role of pretend play in children's cognitive development. *Early Childhood Research & Practice, 4*(1), n1.
- Bilhartz, T. D., Bruhn, R. A., & Olson, J. E. (1999). The effect of early music training on child cognitive development. *Journal of Applied Developmental Psychology, 20*(4), 615-636.
- Burger, K. (2010). How does early childhood care and education affect cognitive development? An international review of the effects of early interventions for children from different social backgrounds. *Early childhood research quarterly, 25*(2), 140-165.
- Cahill, S. M., & Beisbier, S. (2020). Occupational Therapy Practice Guidelines for Children and Youth Ages 5–21 Years. *American Journal of Occupational Therapy, 74*(4), 7404397010p1-7404397010p48.
- Chaparro, J., Sojourner, A., & Wiswall, M. J. (2020). *Early childhood care and cognitive development* (No. w26813). National Bureau of Economic Research.
- Dankiw, K. A., Tsiros, M. D., Baldock, K. L., & Kumar, S. (2020). The impacts of unstructured nature play on health in early childhood development: A systematic review. *PloS one, 15*(2), e0229006.
- Doss, C., Fahle, E. M., Loeb, S., & York, B. N. (2019). More Than Just a Nudge Supporting Kindergarten Parents with Differentiated and Personalized Text Messages. *Journal of Human Resources, 54*(3), 567-603.
- Drago, F., Scharf, R. J., Maphula, A., Nyathi, E., Mahopo, T. C., Svensen, E., ... & Rogawski McQuade, E. T. (2020). Psychosocial and environmental determinants of child cognitive development in rural south africa and tanzania: findings from the mal-ed cohort. *BMC public health, 20*, 1-8.
- Foley, B. C., Owen, K. B., Bauman, A. E., Bellew, W., & Reece, L. J. (2021). Effects of the Active Kids voucher program on children and adolescents' physical activity: a natural experiment evaluating a state-wide intervention. *BMC Public Health, 21*(1), 1-16.
- Keizer, R., van Lissa, C. J., Tiemeier, H., & Lucassen, N. (2020). The Influence of Fathers and Mothers Equally Sharing Childcare Responsibilities on Children's Cognitive Development from Early Childhood to School Age: An Overlooked Mechanism in the Intergenerational Transmission of (Dis) Advantages?. *European Sociological Review, 36*(1), 1-15.
- Laverdure, P., & Beisbier, S. (2021). Occupation-and Activity-Based Interventions to Improve Performance of Activities of Daily Living, Play, and Leisure for Children and Youth Ages 5 to 21: A Systematic Review. *American Journal of Occupational Therapy, 75*(1), 7501205050p1-7501205050p24.
- Lee, J., Zhang, T., Chu, T. L. A., Gu, X., & Zhu, P. (2020). Effects of a fundamental motor skill-based afterschool program on children's physical and cognitive health outcomes. *International journal of environmental research and public health, 17*(3), 733.
- Logan, N. E., Raine, L. B., Drollette, E. S., Castelli, D. M., Khan, N. A., Kramer, A. F., & Hillman, C. H. (2021). The differential relationship of an afterschool physical

Data feedback and behavioral change effects of an exclusive personalized intervention on children

- activity intervention on brain function and cognition in children with obesity and their normal weight peers. *Pediatric Obesity*, *16*(2), e12708.
- Lubans, D. R., Foster, C., & Biddle, S. J. (2008). A review of mediators of behavior in interventions to promote physical activity among children and adolescents. *Preventive medicine*, *47*(5), 463-470.
- Meier, S. T., & Davis, S. R. (2019). *The elements of counseling*. Waveland Press.
- Ng, M. Y., & Weisz, J. R. (2016). Annual research review: Building a science of personalized intervention for youth mental health. *Journal of Child Psychology and Psychiatry*, *57*(3), 216-236.
- Ng, M. Y., & Weisz, J. R. (2018). Personalizing evidence-based psychotherapy for children and adolescents in clinical care.
- Norris, E., van Steen, T., Direito, A., & Stamatakis, E. (2020). Physically active lessons in schools and their impact on physical activity, educational, health and cognition outcomes: a systematic review and meta-analysis. *British journal of sports medicine*, *54*(14), 826-838.
- Obradović, J., Yousafzai, A. K., Finch, J. E., & Rasheed, M. A. (2016). Maternal scaffolding and home stimulation: Key mediators of early intervention effects on children's cognitive development. *Developmental psychology*, *52*(9), 1409.
- Peralbo-Uzquiano, M., Fernández-Abella, R., Durán-Bouza, M., Brenlla-Blanco, J. C., & Cotos-Yáñez, J. M. (2020). Evaluation of the effects of a virtual intervention programme on cognitive flexibility, inhibitory control and basic math skills in childhood education. *Computers & Education*, *159*, 104006.
- Ramey, C. T., & Ramey, S. L. (1998). Prevention of intellectual disabilities: early interventions to improve cognitive development. *Preventive medicine*, *27*(2), 224-232.
- Rutter, M. (1985). Family and school influences on cognitive development. *Journal of child psychology and psychiatry*, *26*(5), 683-704.
- Schmidt, M., Mavilidi, M. F., Singh, A., & Englert, C. (2020). Combining physical and cognitive training to improve kindergarten children's executive functions: A cluster randomized controlled trial. *Contemporary Educational Psychology*, *63*, 101908.
- Scott, S. (2016). Commentary: Finding out the best way to tailor psychological interventions for children and families—a commentary on Ng and Weisz (2016). *Journal of Child Psychology and Psychiatry*, *57*(3), 237-240.
- Shelleby, E. C., & Shaw, D. S. (2014). Outcomes of parenting interventions for child conduct problems: A review of differential effectiveness. *Child Psychiatry & Human Development*, *45*(5), 628-645.
- Taverna, L., Tremolada, M., Dozza, L., Zanin Scaratti, R., Ulrike, D., Lallo, C., & Toso, B. (2020). Who benefits from an intervention program on foundational skills for handwriting addressed to kindergarten children and first graders?. *International Journal of Environmental Research and Public Health*, *17*(6), 2166.
- Van Sluijs, E. M., McMinn, A. M., & Griffin, S. J. (2007). Effectiveness of interventions to promote physical activity in children and adolescents: systematic review of controlled trials. *Bmj*, *335*(7622), 703.
- Williams, N. J., & Beidas, R. S. (2019). Annual research review: the state of implementation science in child psychology and psychiatry: a review and suggestions to advance the field. *Journal of Child Psychology and Psychiatry*, *60*(4), 430-450.
- Wilson, B., & Barnett, L. M. (2020). Physical activity interventions to improve the health of children and adolescents in out of home care—A systematic review of the literature. *Children and Youth Services Review*, *110*, 104765.

Data feedback and behavioral change effects of an exclusive personalized intervention on children

Wu, H., Eungpinichpong, W., Ruan, H., Zhang, X., & Dong, X. (2020). The Relationship Between Motor Fitness, Fundamental Movement Skills, and Functional Movement Screen in Primary School Children. *bioRxiv*.

Zhang, P., Zhang, T., & Lee, J. (2020). The Role of Psychosocial Factors in Predicting Students' Achievement Outcomes in Physical Education. *JTRM in Kinesiology*.

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Conflict of Interest

Authors declare non conflict of interest in terms of the present research study.

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