EUROPEAN JOURNAL OF BIOMEDICAL AND PHARMACEUTICAL SCIENCES
http://www.ejbps.com

ISSN 2349-8870
Volume: 7
Issue: 10
535-539
Year: 2020

ASSOCIATION OF INTELLIGENCE QUOTIENT AND SELF-CONCEPT WITH ORAL HEALTH STATUS IN CHILDREN

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Article Received on 17/08/2020 **Article Revised on 07/09/2020** **Article Accepted on 27/09/2020**

ABSTRACT

Background and Aim: Nowadays concept of oral health involves the interaction between genetic and environmental factors in which biological, social, behavioural and psychological components are expressed in a highly complex and interactive manner. To find out if there is any association between intelligence quotient and self-concept which are two major psychological parameters designing character of children during their preadolescent ages with oral health status, the present study is conducted selecting children with similar socioeconomic background. Any significant association will help in providing better ways of oral health care management in these children. **Material and Methods:** This cross sectional, observational study was conducted at tertiary care institute of India. In our study we have included a sample of 250 subjects - including both males and females. Cattell's culture fair intelligence test was used to measure intelligence. OHI-S index, DMF index and dft index, Modified Gingival index were used measure oral health status. **Results:** The comparison between age and self concept was statistically significant with (p value 0.02) indicating, as age increases self concept value also increases. In gender wise comparison of IQ the p value was found to be 0.10 and self concept gave a P value of 025. Both comparisons were not statistically significant. The study subjects with superior, high average and above average IQ were found to have good OHI-S values,low DMFT aswell as dft scores and reduced gingival index values. Those with low and very low IQ values were found to have poor oral hygiene status, increased DMFT and dft scores and higher GI values. **Conclusion:** Psychological parameters like IQ and self concept can be used as oral health status indicators in young children. Combination of IQ and self concept analysis gives a puissant way of predicting oral health maintenance capacities of children.

KEYWORDS: children, intelligence quotient, oral health, psychological components.

INTRODUCTION

Socially handicapped children are those children whose healthy personality development and full unfolding of potentialities are hampered by certain elements in their social environment such as parental inadequacy, environmental deprivation, and emotional disturbances.[1] The pattern of orphanage living is different from family living as the latter provides physical security, food, and shelter but is devoid of psychological security. These children form a population at risk with reference to abnormal psychosocial development.[2]

Despite great improvements in the oral health of populations in several countries, global problems still persist. Oral diseases such as dental caries, periodontal disease, are one of the major public health problems. A bio-psychosocial model of disease is highly relevant to dentistry since most oral health problems can be prevented or controlled through preventive behaviours. Recent work illustrates the potential contribution of psychosocial factors in understanding the disease process, as well as improving caries risk prediction.[3]

Intelligence can be expected to have a significant impact on children's understanding of causes and consequences, information and instructions. It may also influence their ability to communicate feelings or distress and to behave adequately in the dental situation.[4] Attention problems have been associated with refusal of dental treatment in children. Children with low IQ need significantly longer time to accept the dental treatment situation. Intelligence was found to be more strongly associated with children's dental anxiety.[5] High IQ may be more effective than a

low IQ in moderating the level of cooperation during dental treatment of children.

In a country like India, the children are undergoing a multitude of experiences, and various influences are affecting them. Therefore, the developing needs and their basic interests are to be studied carefully. A proper psychological testing can only enable any sincere and effective steps in the development of any plans and strategies for children. Moreover, it is also important to know how young people with dental caries and gingivitis feel about themselves, which is integral to the development of a positive child-clinician relationship. Nowadays, researches point out the need to consider the functional and psychosocial dimensions of oral health for the implementation and evaluation of public health dentistry interventions.[6]

The most widespread misconception that a mere intelligence quotient (IQ) score of above 150 can open doors for success and prosperity is what deters adults from introducing their children and students to the fascinating field of emotional intelligence. As put forth by Goleman, IQ determines only 20% of success that individuals achieve in their lives, while 80% of it is determined by one's emotional quotient. We, as professionals, should assume the unequivocal responsibility of communicating these and other similar findings to the general population in as many ways as possible.

Children who can better cope with frustrations and challenges are more likely to think of themselves as successful which will lead to a higher self-esteem. In contrast, children who become easily frustrated and discouraged, often quit or need extra assistance to complete a task. These child may have lower self-esteem if they start to believe that they can't be successful.

Self-esteem serves a motivational function by making it more or less likely that people will take care of themselves and explore their full potential. People with high self-esteem are also people who are motivated to take care of themselves and to persistently strive towards the fulfilment of goals. People with lower self-esteem tend to let important things slide and to be less persistent. They are generally less motivated to pursue them to their conclusion.

Nowadays concept of oral health involves the interaction between genetic and environmental factors in which biological, social, behavioural and psychological components are expressed in a highly complex and interactive manner. To find out if there is any association between intelligence quotient and self-concept which are two major psychological parameters designing character of children during their preadolescent ages with oral health status, the present study is conducted selecting children with similar socioeconomic background. Any significant association will help in providing better ways of oral health care management in these children.

MATERIALS AND METHODS

This cross sectional, observational study was conducted at tertiary care institute of India. Ethical approval was taken from the institutional ethical committee and written informed consent was taken from all the participants.

Based on published literature,[7] assuming 90% power, 5% level of significance, 5% absolute precision, the required sample size was 110. In our study we have included a sample of 250 subjects - including both males and females.

Inclusion criteria

- All the subject selected were medically fit, healthy and free of any systemic diseases (American Society of Anesthesiologists-I).
- Children selected were of same socio-economic status and geographical distribution.
- All selected children were on a vegetarian diet.
- Children selected were free from any development disorder related to psychiatric illness.
- All children were living with their respective family members.

Exclusion criteria

- Children with any systemic disease or any kind of allergy or with any history of antibiotic consumption in the recent past.
- Children with local factors that might affect gingival condition like lip incompetence, mouth breathing, orthodontic appliance, cleft lip or palate.
- Children with the disorder like attention deficit hyperactivity disorder, obsessive-compulsive disorder, hyperkinetic child, etc.
- Children with defective audio, speech or visual acuity

Cattell's culture fair intelligence test was used to measure intelligence.[8] A total of 4 tests categories are there in Culture fair test. Test 1 includes 12 questions, test 2 has 14 questions, test 3 included 12 questions, test 4 has 8 questions.1 Dr S P Ahluwalia's Children's self-concept scale was used to determine the self-concept level.2 It has a total of 6 parameters with 80 questions: parameter 1-16 questions, parameter 2-18 questions, parameter 3-12 questions, parameter 4-12 questions, parameter 5-12 questions and parameter 6-10 questions. OHI-S index, DMF index and dft index, Modified Gingival index were used measure oral health status.

Statistical analysis

The recorded data was compiled and entered in a spreadsheet computer program (Microsoft Excel 2007) and then exported to data editor page of SPSS version 15 (SPSS Inc., Chicago, Illinois, USA). For all tests, confidence level and level of significance were set at 95% and 5% respectively.

RESULTS

Age wise comparison of IQ had not given any consistent association between IQ and age of study subject's. The comparison gave p value of 0.13 which was not statistically significant. The comparison between age and self concept was statistically significant with (p value 0.02) indicating, as age increases self concept value also increases. (Table 1)

In gender wise comparison of IQ the p value was found to be 0.10 and self concept gave a P value of 025. Both comparisons were not statistically significant. (Table 2)

In comparative evaluation of IQ and self concept it was found out that; among the study subjects with high self concept, about 60% exhibited higher values of IQ levels which is statistically significant. While among those with average self concept; 65.5% of the students have low values of IQ also; distributed into below average, low and very low IQ levels. This comparison gives P value 0.001 and was found to be statistically significant.

The study subjects with superior, high average and above average IQ were found to have good OHI-S values, low DMFT aswell as dft scores and reduced gingival index values. Those with low and very low IQ values were found to have poor oral hygiene status, increased DMFT and dft scores and higher GI values. The gradual reduction in IQ values associated with decline in Oral Hygiene status, which statistically significant with p value of <0.001.The rise in DMFT and dft scores with reduction in IQ value was statistically significant p value< 0.001. The comparison between IQ and gingival health gave p value < 0.001 which was statistically significant. Comparison of OHIS scores among the three groups had given statistically significant p value of <0.001; as self concept increases OHIS scores were found to be decreasing (Table 3).Mean DMFT and dft scores among children with high self concept status is found to be less than that of above average and average self concept children. Comparison of DMFT scores was found to be statistically significant with p value < 0.001. Similarly comparison of dft scores had given statistically significant p value of 0.003 (TABLE: 3).High self concept status' children have mean Gingival index score less than that of other two groups. This comparison was also statistically significant with P value <0.001 (TABLE 3)

Table 1: Age wise comparison of Intelligent Quotient and Self Concept among study subjects using Chi Square Test.

Variables	Category	8 years		9 years		10 years		11 years		12 years		P value
		n	%	n	%	n	%	n	%	n	%	
IQ	Superior	0	0.0%	3	4.8%	2	2.4%	0	0.0%	0	0.0%	0.07
	High Avg.	0	0.0%	3	4.8%	2	2.4%	0	0.0%	0	0.0%	
	Above Avg.	0	0.0%	6	9.6%	6	7.2%	10	23.8%	0	0.0%	
	Average	6	18.7%	11	17.7%	20	24.0%	7	16.6%	7	18.9%	
	Low Avg.	14	43.7%	22	35.4%	23	27.7%	9	21.4%	10	23.2%	
	Below Avg.	10	31.2%	13	20.9%	24	28.9%	9	21.4%	16	37.2%	
	Low	2	6.2%	4	6.4%	6	7.2%	7	16.6%	4	9.3%	0.01*
Self Concept	High	6	17.6%	22	40%	22	27.8%	12	26.6%	4	10.8%	
	Above Avg.	21	61.7%	23	41.8%	41	51.8%	20	44.4%	19	51.3%	
	Average	7	20.5%	10	18.1%	16	20.2%	13	28.8%	14	37.8%	

Table 2: Gender wise comparison of Intelligent Quotient and Self Concept among study subjects using Chi Square Test.

Variables	Category	Males		Females		P value
		n	%	n	%	
IQ	Superior	3	2.4%	3	2.3%	0.10
	High Avg.	3	2.4%	3	2.2%	
	Above Avg.	14	11.2%	12	9.5%	
	Average	20	16.12%	30	23.8%	
	Low Avg.	40	32.2%	36	28.5%	
	Below Avg.	32	25.8%	36	28.5%	
	Low	12	9.6%	6	4.7%	
Self Concept	High	35	29.4%	30	22.9%	0.25
	Above Avg.	56	47.05%	67	51.1%	
	Average	28	23.5%	34	25.9%	

Table 3: Comparison of mean values of Oral health findings based on Self Concepts among study subjects using Kruskal Wallis Test followed by Mann Whitney Post hoc Test.

Variables	Self Concept	Mean	SD	P value
OHIS	High Avg.	1.32	0.31	0.001*
	Above Avg.	1.79	0.55	
	Average	2.21	0.57	
DMFT	High Avg.	1.12	0.91	0.002*
	Above Avg.	2.10	0.89	
	Average	2.60	0.87	
Deft	High Avg.	0.79	0.91	0.004*
	Above Avg.	1.50	1.19	
	Average	1.36	1.55	
GI	High Avg.	0.89	0.48	0.01*
	Above Avg.	1.40	0.62	
	Average	1.82	0.59	

DISCUSSION

Dental caries and periodontal diseases are two major oral health concerns worldwide both diseases are of multifactorial in origin and abundance of research has been dedicated to know the etiological factors of these diseases. Many studies have tried to assess the relation between socio-behavioral factors and dental caries and few studies relating to periodontal diseases.[9]

Psychology plays an important role in determining a person's behavior, but not many studies have been conducted in this regard. Psychology can be categorized under one or the other headings of intelligence, personality, temperament, maturity, curiosity, liking, study habits, adjustment functions, anxiety, developmental screening, creativity and others like frustration, general learning abilities, psychopathology, deprivation and helplessness.[10]

The link between low IQ and childhood psychopathology has been registered in many studies and also evaluated in children because of their behavioral problems in schools. IQ tests do not measure how emotions may interfere with a child's capabilities in school and society. A child experiencing anxiety may be quite intelligent but may perform poorly in some test simply due to emotional interferences.

The ability to adapt to a complex environment requires skills and traits that lie outside definitions of traditional intelligence. Hence in our study we have assessed IQ, as complex cognitive ability that allows humans to flexibly adapt their thinking to new problems or situations. The concept has been defined by Cattell (1971) as: "an expression of the level of complexity of relationships which an individual can perceive and act upon when he does not have recourse to answers to such complex issues already sorted in memory".

In other words, Cattell's culture fair test measures the ability to reason under novel conditions and stands in contrast to performance based on learned knowledge and skills.[11] In our study IQ was assessed by tasks that were nonverbal and relatively culture-free.

Transitional period from childhood to adolescence,which coincides with mixed dentition stage;is an important developmental stage for physical development, formation and maturation of psychological characteristics, including self-identity and self-esteem, which may impact on adult life.[12]

Thus in our study we have tried to find out association between IQ(in a way devoid of sociocultural ,environmental and specific learning influences) and self concept to oral hygiene status in 8-12 year old children.

In the present study IQ, self concept and oral hygiene status was assessed in children aged 8-12 years, as this is the transitional stage of dentition and most of the children would start performing oral hygiene maintenance tasks by themselves by seven to eight years. Also we aimed at an age group of children who can interpret and cooperate more effectively for IQ and self concept tests.

Self-concept develops, around age 7 or 8, when children are developmentally prepared to interpret their own feelings and abilities, and also based on feedback they receive from parents, teachers, and peers.

In the present study children of similar socioeconomic background were considered to avoid differences that could have arised due to easy availability of better oral health care services for children of higher economic background; and similarly low socioeconomic class children were not included in order to avoid interference of oral health issues due to poor availability of oral health care provisions.

Comparison between IQ and self-concept shows significant association between two parameters with p value of <0.001. High IQ children feel competent on different ability domains due to childrens' achievement levels at school, and these high-performing children would describe their self concept upwards and low-performing children adjust them downwards.

Comparison of IQ with oral health status has shown direct influence of IQ on oral health of children. It is understood from the study results that as IQ values are high, oral health status is also improving with reduced OHIS scores, DMFT values and GI scores. The present study results are in accordance with a study done by Saumya Navit et al[13] on interrelationship of Intelligence Quotient with Caries and Gingivitis.

The present study also gives distinct association between selfconcept and oral health status. Those study subjects with high selfconcept levels are found to have improved oral health status.

This result is similar to that obtained by Diah Ayu Maharani et al (2018).[14] Method of measuring IQ and self concept is a promising endeavour to identify children more prone to oral health related issues and help to adapt early and prompt monitoring of oral hygiene practices and treatment needs with better understanding of psychological level of child's development.

CONCLUSION

Psychological parameters like IQ and self concept can be used as oral health status indicators in young children. Combination of IQ and self concept analysis gives a puissant way of predicting oral health maintenance capacities of children. Thus assessment of the psychological parameters – IQ and self concept gives an early insight into the child's nature as well as treatment requirements. The above study results can be utilized keeping in mind that positive construction of self is critical in the development of health enhancing behaviors and children are more likely to engage in health-enhancing behaviors if they have high levels of the above affective and cognitive skills. Children's oral health promotion, and oral health programmed should incorporate IQ testing-approaches to promote better oral health and better child-clinician relationship.

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