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# A Paired Comparison among Siblings of Common Parents About Dental Care with and without Down Syndrome

## Comparação Pareada da Assistência Odontológica entre Irmãos de Mesmos Pais Portadores ou não de Síndrome de Down

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### RESUMO

**Objetivo:** Comparar a assistência odontológica entre irmãos de mesmos pais portadores ou não de síndrome de Down.

**Método:** Um estudo analítico transversal envolvendo 180 indivíduos com Síndrome de Down e 180 irmãos destes sujeitos sem Síndrome de Down, foi conduzido numa escola de ensino especial na cidade de Udaipur, Rajasthan, Índia. Empregando um modelo de questionário validado, os pais foram solicitados a preencher duas versões do questionário, sendo uma para o filho com Síndrome de Down e outra para o filho com idade mais próxima sem Síndrome de Down.

**Resultados:** Muitos pais apresentaram comportamentos ou experiências diferentes com o filho portador de Síndrome de Down e o respectivo irmão sem Síndrome de Down. As maiores diferenças foram observadas quanto à consulta anual ao dentista ( $p < 0,001$ ), flúor terapia ( $p < 0,001$ ), extrações ( $p < 0,001$ ) e tratamento ortodôntico ( $p < 0,001$ ). As crianças com Síndrome de Down foram menos propensas a visitar o dentista anualmente e a receber flúor terapia e tratamento ortodôntico em comparação aos seus irmãos sem Síndrome de Down.

**Conclusão:** Essa análise pareada sobre diferenças familiares nos comportamentos e experiências de assistência odontológica entre irmãos com e sem Síndrome de Down demonstrou que crianças com Síndrome de Down têm menor probabilidade de serem levadas ao dentista anualmente, receberem cuidados de prevenção à cárie e tratamento restaurador, e serem submetidas a extrações dentárias.

### ABSTRACT

**Objective:** To compare dental care among siblings of common parents with and without Down syndrome.

**Method:** A cross sectional analytical study was conducted in 180 mentally retarded subjects with Down syndrome and 180 their siblings without Down syndrome at a special need school in Udaipur city Rajasthan. Using a validated questionnaire, parents were asked to complete two versions of the questionnaire one for their child with Down syndrome and another for the siblings closest in age without Down syndrome.

**Results:** Many respondents showed different behavior or experiences to their child with Down syndrome and a sibling without Down syndrome. The greatest differences were observed for yearly consultation to the dentist ( $p < 0.001$ ), fluoride therapy ( $p < 0.001$ ), extraction ( $p < 0.001$ ) and orthodontic treatment ( $p < 0.001$ ). Down syndrome subjects were less likely to consult a dentist yearly and less likely to receive fluoride therapy and orthodontic treatment in comparison to their siblings without Down syndrome.

**Conclusion:** This paired analysis of within family differences in dental care behaviors and experiences for subject with Down syndrome and non Down syndrome siblings demonstrated that there are differences, subject with Down syndrome are less likely to consult a dentist yearly, less likely to receive caries-preventive and restorative care and less likely to have had a dental extraction.

### DESCRIPTORES

Síndrome de Down; Higiene bucal; Assistência odontológica para pessoas portadoras de deficiências.

### KEYWORDS

Down syndrome; Oral hygiene; Dental care for disabled.

## INTRODUCTION

Down syndrome (DS) is a genetic condition and is one of the most common causes of retardation of mental development. Down syndrome is an autosomal chromosomal anomaly resulting from trisomy of all, or a critical part, of chromosome 21<sup>1</sup>. Many of the pathological and physiological characteristics, including the orofacial problems of Down syndrome, have been described, and it is evident that this group suffers from very high level of orofacial disease and other problems<sup>2</sup>. According to scully's classification<sup>3</sup> there are three main types of Down syndrome. The majority of those with Down syndrome have three of chromosome 21 (trisomy 21) rather than two. Approximately one out of every 800-1,000 births results in an extra chromosome of the twenty first group called Trisomy 21, or Down syndrome.

If this is the case, then one important avenue of research concerning people with Down syndrome is their access to dental care. The dental care of people with Down syndrome is different to that of the non Down syndrome population at several levels. The provision and/or supervision of be worse than that for non Down syndrome controls<sup>4,5</sup> and this is exacerbated if the individuals with Down syndrome are institutionalized where very poor oral hygiene care has been reported<sup>6</sup>.

The disabled form a substantial section of the community and it is estimated that worldwide there are about 500 million people with various disabilities<sup>7</sup>. Prevalence varies from country to country. The variance in prevalence may be attributed to ascertainment basis, the standardization methods employed from study to study. The recent National Sample Survey Organization (NSSO) report<sup>8</sup> suggests that the number of disabled persons in the country, India is estimated to be 18.49 million which formed about 1.8% of the total population and the mentally retarded population accounts to 0.44 million individuals. So dental management of the handicapped subjects has received scant attention in the liberation compared with the normal child. Until recent years, the management of the handicapped subjects was not even mentioned in the under graduate curriculum of most dental schools in different part of the world. This partly experience why the handicapped subjects has not received its fair share of dental management in the community<sup>9</sup>. Studies investing the oral health needs of such people which indicates that they consistently have worse oral hygiene level and greater incidence of gingival inflammation, yet they experience more untreated disease and more excavation while people with Down syndrome have an inversed prevalence of periodontal

disease compared with general population and other people with the teaching disability<sup>10</sup>.

In spite of the high level of dental disease individuals which disabilities or illness receive less oral care than normal population. Characteristically, it has been reported dental treatment it the greatest unattended health need of the disabled<sup>11</sup>. Some of the most important reasons may be inadequate recall systems, practically difficulties during treatment sessions, socioeconomic status and under estimation of treatment need, communication problems and the bad cooperation<sup>9</sup>.

In Rajasthan, we have no information concerning either the prevalence of health problems experienced by, or the type of dental care provided for people with developmental disabilities, so aim of our study was to evaluate and compare dental care among siblings of common parents with and without Down syndrome.

## MATERIALS AND METHODS

A cross sectional analytical study was conducted in 180 mentally retarded subjects with Down syndrome and 180 their siblings without Down syndrome at a special need school in Udaipur city Rajasthan. Udaipur is located in southeastern zone of Rajasthan. Study was conducted during the period of January 2009.

Parents were asked to complete the two labeled and connected into two different languages copies of questionnaire, one with aspects of their children with Down syndrome and second for their siblings without Down syndrome. Four hundreds questionnaire forms were distributed, among Down syndrome children and their siblings, 40 questionnaires were uncompleted ,so they were excluded from study. Questionnaires are potentially useable and Pretest of questionnaire was done before starting the study.

Among other background questions concerning age gender, residential location, daily activity and general health status of the subject of the questionnaire (i.e. the child be not the parent) the questionnaire contained eight questions concerning home and professional dental care the questions are as follows: (i) Does your child visit the dentist yearly? (ii) has your child ever taken flouride tablets and drops? (iii) Has your child ever received any form of flouride treatment as dentist? (iv) Had your child ever had a tooth extracted? (v) Has your child ever had a filling? (vi) Has your child ever been put to sleep (had a general anesthetic) for a dental procedure dental procedure? (vii) Does your child have or has he/she ever had crown , a bridge or a denture?(viii) Has your child

ever undergone orthodontic treatment (treatment to correct tooth position or malocclusion) (ix) How many times subject brushes his teeth? (x) Did the patient undergo any pit and fissure sealants treatment / therapy ? The response to all questions was 'Yes' or 'No' except question (ix).

Data was entered in Microsoft Excel and analyzed using SPSS software (version. 11). Chi-square tests were used to test the difference in frequencies.  $P < 0.05$  was accepted as statistically significant and  $P < 0.01$  was set to be highly statistically significant.

## RESULTS

Table 1 reveals that in both Down syndrome and sibling group, males subjects were greater than female subjects. In Down syndrome group male subjects were 78.8% while 21.2% were female. It also shows that 100% of siblings residing with parents, while only 58.8% Down syndrome subjects residing with their parents. It also shows that 84.4% Down syndrome patients do their daily activity at specialized school or day center and 45.6% Down syndrome patient were having speech problem. In compare with their siblings, Down syndrome subjects had undergone less dental treatment like scaling, restoration, extraction. Only 46.6 % Down syndrome subjects had visited the dentist in a year. It also shows that 18.8% Down syndrome subjects were doing brushing occasionally while 81.2% Down syndrome subjects used to do brushing atleast once daily with the help of their parents.

Figure 1 shows yearly consultation with dentist, it shows that 15.6% children with Down syndrome were not consulting the dentist, while 26.7% their siblings did vice versa in 13-17 year old subjects. ( $P < 0.0001$ ). While 16.7% Down syndrome subjects never consulted the dentist in a year among 8-12 year old children in comparison to 6.7% their sibling ( $P < 0.0001$ ).

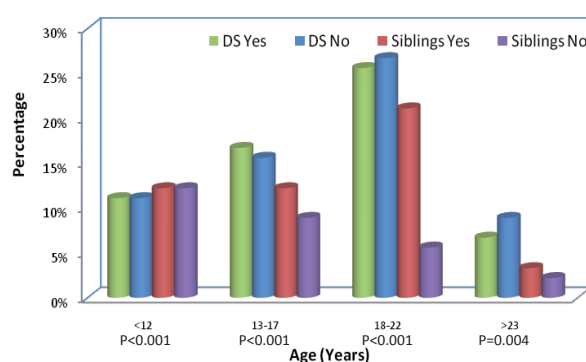


Figure 1. Yearly consultation with dentist.

Figure 2 shows experience of professional fluoride, it reveals that 20% of children with Down syndrome were not receiving either form of fluoride, while 6.7% their sibling did vice versa in 23-27 year old children ( $P < 0.0001$ ). While only 1.1% Down syndrome subjects had professional fluoride in the same age group.

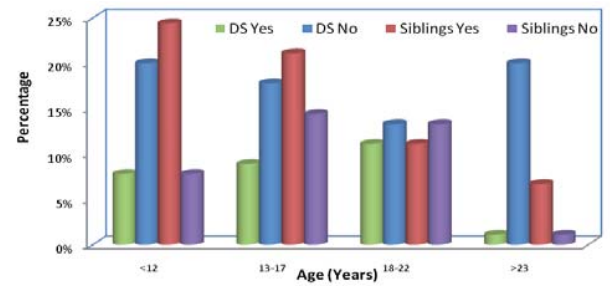


Figure 2. Experience of professional fluoride use.

Figure 3 shows experience of any tooth extraction, it reveals that 16.7% subjects with Down syndrome never had experienced a tooth extraction, while 5.6% their siblings did vice versa in 23-27 year age group ( $P < 0.0001$ ). While only 4.4% of both subjects had experience of tooth extraction in the same age group.

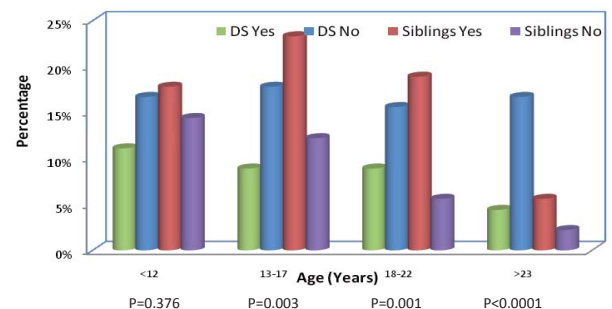


Figure 3. Experience of tooth extraction.

Figure 4 shows experience of any filling and restoration. It reveals that 18.9% of subjects with Down syndrome had not received any restorative treatment, while 14.4% their siblings did vice-versa in 8-12 year age group ( $P = 0.063$ ). While in 13-17 year age group, 5.6% Down syndrome subjects had a restorative treatment in comparison to 13.3% their siblings ( $P = 0.160$ ).

Figure 5 shows experience of any crown, bridge or denture, it reveals that 15.6% subjects with Down syndrome had not received a crown, bridge or denture, while 10% their siblings did vice-versa in 18-22 year age group ( $P = 0.191$ ), while in 8-12 year age group, only 1.1% Down syndrome subjects had never received a crown, bridge or denture in comparison to 21.1% their siblings ( $P < 0.0001$ ).

**Table 1. Descriptive statistics for the subjects with Down syndromes and their siblings.**

Variables	Categories	Down Syndrome Group		Siblings Group		P
		n	%	n	%	
Gender	Male	142	78.8	110	61.2	<0.0001
	Female	38	21.2	70	38.8	
Age (years)	<12	50	27.8	58	32.2	0.003
	13-17	48	26.6	64	35.6	
	18-22	44	24.4	44	24.4	
	>23	38	21.2	14	7.8	
Residence	With parents	106	58.8	180	100%	<0.0001
	Elsewhere	74	41.2	0	0.0	
Daily activities	At home	08	4.4	0	0.0	<0.0001
	At normal school	06	3.4	180	100	
	At specialized school or day center	152	84.4	0	0.0	
	Working in the community	04	2.2	0	0.0	
	Working in protected environment	10	5.6	0	0.0	
Health status	Heart problems	0	0.0	0	0.0	<0.0001
	Immunological problems	04	2.2	0	0.0	
	E.N.T. problems (Ear, Nose, Throat)	0	0.0	0	0.0	
	Speech problems	82	45.6	0	0.0	
	No	94	52.2	180	100	
Yearly consult	Yes	84	46.6	142	78.8	<0.0001
	No	96	53.4	38	21.2	
Fluoride tablets/Drops	Yes	64	35.6	110	61.2	<0.0001
	No	116	64.4	70	38.8	
Professional fluoride	Yes	52	28.8	114	63.4	<0.0001
	No	128	71.2	66	36.6	
Extraction	Yes	60	33.4	118	65.6	<0.0001
	No	120	66.6	62	34.4	
Restoration	Yes	64	35.6	86	47.8	0.02
	No	116	64.4	94	52.2	
General Anesthesia	Yes	42	23.4	82	45.6	<0.0001
	No	138	76.6	98	54.4	
Crown/Bridge/Denture	Yes	48	26.6	68	37.8	0.02
	No	132	73.4	112	62.2	
Orthodontic treatment	Yes	46	25.6	104	57.8	<0.0001
	No	134	74.4	76	42.2	
Pit and fissure sealants	Yes	146	81.2	130	72.2	0.04
	No	34	18.8	50	27.8	
Scaling	Yes	52	28.8	61	33.4	0.362
	No	128	71.2	120	66.6	
Oral hygiene practice (tooth brushing)	Once daily	130	72.2	146	81.2	0.06
	Occasionally	34	18.8	50	27.8	

Figure 6 shows experience of any orthodontic treatment, it reveals that 16.7% of subjects with Down syndrome had not received orthodontic treatment, while 12.2% their siblings had received such treatment in 18-22

year age group.(P=0.119) While in 23-27 year age group 5.6% Down syndrome subjects had orthodontic treatment in comparison to 6.7% their siblings ( P<0.0001).

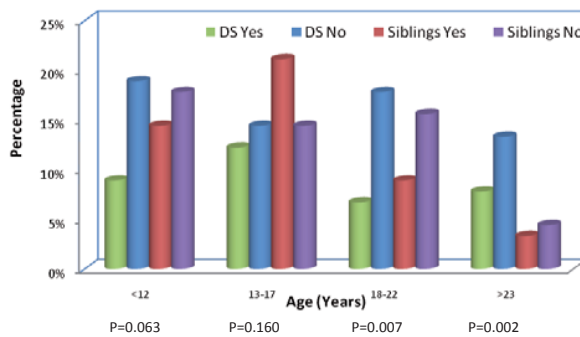


Figure 4. Experience of any filling or restoration.

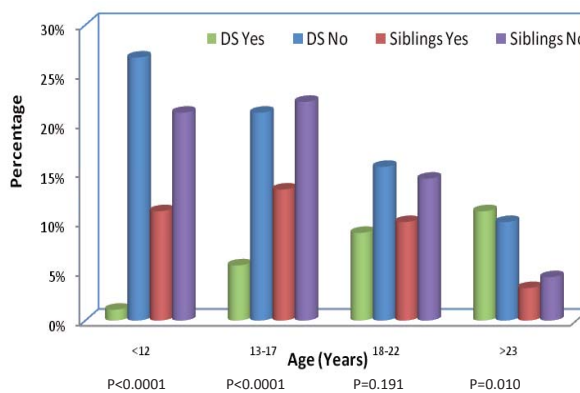


Figure 5. Experience of any crown, bridge or denture.

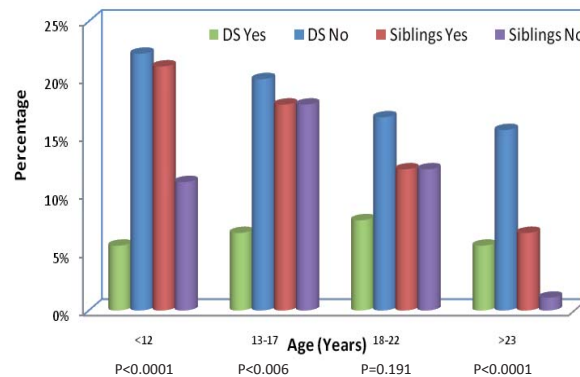


Figure 6. Experience of any orthodontic treatment.

drops and 74.4% of Down syndrome patient never had orthodontic treatment. While other study<sup>2</sup> showed that depending on the age 13.3% Down syndrome subjects never consulted a dentist yearly, 69.6% of Down syndrome patients never had a fluoride tablets or drops and 85.7% Down syndrome subjects never had an orthodontic treatment.

Dental consultation patterns varies by country, studies from France and Denmark reported that children with Down syndrome were more likely to visit a dentist yearly than their non-Down syndrome siblings<sup>6</sup> or other non Down syndrome group<sup>12</sup> while a study in UK found that the inverse was the case<sup>13</sup>. In our study siblings are more likely to visit the dentist yearly than Down syndromes patients. This difference might be due to the parental neglect, inadequate recall systems, practically difficulties during treatment sessions, poor socioeconomic status in India.

In this study 28.8%, 35.6%, 26.6%, 81.2% Down syndrome subjects had scaling, restoration, crown and bridge, pit and fissure sealants treatment respectively. While in a study conducted previously<sup>2</sup> shows that 52.7%, 26.0%, 5.0%, 14.3% Down syndrome patients had professional fluoride therapy, restoration, crown and bridge, orthodontic treatment respectively.

Looking at the study findings concerning caries management specifically, results of various studies fit the popularly held belief that people with Down syndrome have lower rates of caries than people without Down syndrome<sup>14-16</sup> while in our study also children with Down syndrome received less preventive and restorative therapy in comparison to sibling without Down syndrome. However, bearing in mind the limitations of the research claiming lower caries rates in people with Down syndrome<sup>4,17</sup>, it remains to be demonstrated with appropriately designed research whether this difference in caries management experience is because of differences in disease rates and/or management strategies in people with Down syndrome and those without.

## DISCUSSION

This study was designed to test hypothesis that selected aspects of dental care differ between subjects with Down syndromes and their siblings when age was kept as constant. Having observed these differences, we compared the Down syndrome subjects and their siblings on the basis of age groups in respect to selected aspect of dental care.

In our study 53.4% Down syndrome subjects never consulted the dentist yearly while 64.4% of Down syndrome patients never had a fluoride tablets or

## CONCLUSION

This paired analysis of within family differences in dental care behaviors and experiences for subject with Down syndrome and non Down syndrome siblings demonstrates that where there are differences, subject with Down syndrome are less likely to consult a dentist yearly and less likely to receive caries-preventive and restorative care, and less likely to have had a dental extraction. The present study observed that poor oral health is a major problem for mentally disabled subjects



and their oral health seemed to indicate a cumulative neglect which may be a part of overall parental neglect of these children in relation to other basic health measures or may reflect the attitude that oral health lacks importance in the overall scheme of health management. The other reason for the poor dental care of subjects with Down syndrome may be inadequate recall systems, practical difficulties during treatment sessions, socioeconomic status and under estimation of treatment need, communication problems and the bad cooperation.

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