

Prosthetic Status and Prosthetic Needs of Mentally Challenged Individuals Attending Special Schools in Nasik District, Maharashtra, India

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Abstract

Objectives: Mentally challenged individuals are faced with many challenges in understanding and maintain their health and are particularly vulnerable to having unmet health care needs. Prosthetic status of these individuals has received a very little attention and there is paucity of information about their prosthetic status and prosthetic needs. A cross sectional study was conducted to assess the prosthetic status and prosthetic needs of mentally challenged individuals attending special schools in Nasik district, Maharashtra, India. **Subjects and methods:** On the basis of convenient nonprobability sampling technique. All the mentally challenged individuals residing at special school of Nasik district was examined to assess for prosthetic status and prosthetic needs. Data was evaluated by using Statistical Package for Social Science version 20. Data comparison was done by applying Chi-square test. **Results:** A total 272 subjects were examined. Out of that 201 were male subjects and 71 were female subjects. Among 272 study subjects, 20.56% of the subjects were having prosthesis. 73.16% of study subjects were having prosthetic needs, that includes single and multiple unit prosthesis. The need for single unit prosthesis (46.31%) was higher than multiple unit prosthesis (26.83%). Female subjects were reported higher prosthetic needs (94.28%) than male subjects (66.58%) in all groups, but the difference was not statistically significant. **Conclusion:** The results of the study shows that, there was high percentage of unfulfilled prosthetic needs among mentally challenge individuals attending in special school in Nasik district A strong deficit was seen in between the prosthetic needs and prosthetic status.

Keywords: Mentally challenged; WHO 1997 methodology; Prosthetic status; Prosthetic needs

Introduction

Mental disability is a general term used when an individual's intellectual development is significantly lower than average and his or her ability to adapt to environment is consequently limited.^[1,2] According to American association of Mental retardation (AAMR) mental retardation is a disability that occurs before age 18. It is characterized by significant limitations in intellectual function and adaptive behavior as expressed in conceptual social and practical adaptive skills.^[3,4]

Mentally challenged subjects are found in all societies of the world. Almost 75% of the population diagnosed as mentally retarded have mild mental retardation, while the remaining 25% have either moderate or severe and profound grade of mental retardation.⁴ In India in 1991, out of 1000 children in the rural areas, 31 had some development delays, whereas in urban areas 9 out of every 1000 children had some development delays.^[5] Epidemiological studies on prevalence of mental disorder in India, has shown median prevalence of 4.2 with the range of 1.4-25 for mentally challenged subjects per 1000 individuals. On average 7.5 million individuals in India are mentally challenged.^[6]

Mentally challenged subjects may have impaired mobility

neuromuscular problem (drooling, gagging and swallowing problems), uncontrolled body movements, gastro esophageal reflux or seizures.^[7] They may also exhibit delay in language development, deficit in memory skills and greater risk for health problem, require extra help and rely on others to achieve and maintain good health.^[8,9] Oral health is not exception to this and may result into inadequate oral care and put them at higher risk for developing oral health problem.^[10]

The extensive exploration of the review has shown that there are several studies about the caries status, periodontal status and dentofacial abnormalities of mentally challenged individuals. Surprisingly scarce information is available on prosthetic status and prosthetic needs of mentally challenged individuals. Savtun B,^[11] studied the dental status and treatment needs among institutionalized mentally subnormal person in Norway, and reported slightly higher prosthetic needs. Gotowka, Johnson and Gotowka^[12] investigated about cost providing Dental

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services to adult mentally retarded. Russell and Kinirons^[13] suggested that lack of experience and knowledge concerning the treatment of the disabled was commonest reason for not offering comprehensive dental care to the disabled. On the similar line, the study was carried out to investigate prosthetic status and prosthetic needs of mentally challenged individuals attending special schools in Nasik district, Maharashtra, India.

Material and Methods

A cross-sectional study following the Strengthening the reporting of observational studies in epidemiology^[14] guidelines was conducted to assess prosthetic status and prosthetic needs of mentally challenged individuals in Nasik city.

Ethical clearance

The detailed proposed study protocol was submitted and approved by the ethical committee of MUHS University, Nasik.

Informed consent

Prior to start of the study, a visit to all the special schools for mentally challenged individuals in Nasik District was made. The purpose and procedure of the study was explained to the Head of the institutions and a written permission was taken from concern authorities. All the informed consent was obtained from the heads of the special schools to which the subject belong and or from the parents or guardians. The study was carried out on mutually convenient dates for the institutional authorities and to the investigator.

Source of data

List of all the special school in Nasik district was obtained from social welfare department, Nasik. There are total eight special schools for mentally challenged individuals in Nasik District. The entire study subject in these eight schools was included in the study.

Sampling design and sample selection

Microsoft Office Excel 2007 spreadsheet was used for statistical data processing. The SPSS (V 16 2007) and Graph Pad Prism 5 software was used to determine whether there is a relationship between the characters being compared. Thus, for comparison tests of positive isolates of each patient group, we used the Student T test, and the Fischer's test for lower number series. $P < 0.05$ was considered statistically significant.

Based on convenient nonprobability sampling technique, all the mentally challenged individuals present in the special schools of Nasik District who were present at the time of examination and who full filled the selection criteria were examined.

A survey was systemically scheduled to spread over a period of 5 month. A detailed monthly and weekly schedule was prepared well in advance by informing and obtaining consent from authorities of respective schools. Twelve to fifteen study subjects were examined per day to avoid the examiner fatigue as these subjects needed more time compared to the general population for examination

Inclusion criteria

All the mentally challenged individuals are attending special school in Nasik district. There are total nine special schools for mentally challenged individuals in Nasik District, of which eight special schools were included in the study as permission was not granted to conduct the study in one of the special schools. All study subjects in these eight special schools were included in the study.

Exclusion criteria

- Study subjects who are contraindicated for examination
- Study subjects with previous history of obnoxious behavior as informed by the school authority
- Study subjects for whom permission was not granted by the authorities

Sample size

There were total 296 study subjects in eight special schools in Nasik district. Out of these, 24 were excluded from the examination not being present on the day of examination or not able to come to the examination room as per exclusion criteria. Remaining 272 subjects were examined using WHO 1997 methodology. Out of 272 study subjects, 201 (73.89%) were males and 71 (26.10%) were females.

Clinical examination

The oral examination was carried out using basic Oral Health Surveys. WHO 1997 criteria using artificial light, WHO, Oral Health Assessment forms were used to record the data13-3015. The examination was carried out by single examiner, trained and calibrated prior to the study and recorded by a trained recording clerk.

Evaluation of prosthetic status

The presence of the prosthesis was recorded for each jaw. The codes and criteria were as following:

- 0- No prosthesis
- 1- Bridge
- 2- More than one bridge
- 3- Partial denture
- 4- Both bridge (s) and partial denture (s)
- 5- Full removable denture
- 9- Not Recorded.

Evaluation of prosthetic needs

The recording was made for each jaw for the need of the prosthesis, according to following codes:

- 0- No prosthesis needed
- 1- Need for one unit prosthesis (one tooth replacement)
- 2- Need for multi-unit prosthesis (more than one tooth replacement)
- 3- Need for a combination of one-and/or multi-unit prosthesis
- 4- Need for full prosthesis (replacement of all teeth)
- 9- Not recorded.

Statistical analysis

All the obtained data were entered into a personal computer on Microsoft excel sheet and analyzed using the software; Statistical Package for Social Science (SPSS; IBM, USA) version 20. Data comparison was carried out by applying Chi-square test. The statistically significant level was fixed at $P < 0.05$.

Results

There were total 296 study subjects in eight special schools in Nasik district. Out of these, 24 were excluded from the examination not being present on the day of examination or not able to come to the examination room as per exclusion criteria. Remaining 272 subjects were examined using WHO 1997 methodology, observation were recorded and the results were calculated.

Among the 272 study subjects 201 (73.89%) were males and 71 (26.10%) were females. The study subjects with age range of 6yrs to 30 years and mean age of 13.84 ± 5.24 years. The study population was divided in three groups as 6-12 years age group that includes 101 (36.46%) subjects, 12-18 years age group, that includes 111 (40.07%) subject and age group of 18 years and above, that includes 60 (21.66%) subjects [Table 1].

It is observed that, overall percentage of prosthetic status among

Table 1: Distribution of total sample by age and sex.

Age Group	Male N (%)	Female N (%)	Total N (%)
6-12 years	72 (71.28)	29 (28.71)	101 (37.13)
12-18 years	85 (76.57)	26 (23.42)	111 (40.80)
18 years and above	44 (73.33)	16 (26.66)	60 (21.66)
Total	201 (73.89)	71 (26.10)	272 (100)

272 subjects was 20.56 (56/272). The percentage of prosthetic status among male subjects were 18.88 (12.93% of single unit and 5.95 of multiple unit prosthesis) and female subjects were 25.29 (15.45% of single unit and 9.48% of multiple unit prosthesis). The age group of 18 years and above were reported 44.97% of single and multiple unit prosthesis followed by 12-18 years age group i.e., 16.56% single and multiple unit prosthesis and 6-12 years group were reported 10.89% of single and multiple unit of prosthesis [Table 2 and Figure 1].

An overall percentage prosthetic need among 272 study subjects was 73.16 (199/272). Male subject were showing 66.58 (132/201) and female subjects were showing 94.28 (67/71) percentage of prosthetic needs. Overall percentage of single unit and multiple unit prosthetic needs among 272 subjects were 46.31 and 26.88 respectively. The percentage of male subjects with single unit and multiple unit prosthetic needs were 41.28 and 24.31 respectively. Similarly percentage of female subjects with single unit and multiple unit prosthetic needs were 60.54 and 33.74 respectively [Table 3 and Figure 2].

Age group of 18 years and above were reported highest percentage of prosthetic needs i.e., 123 (84.98% of single unit and 58.32% of multiple unit), followed by 12-18 years age group that shows 81.05% (44.13% of single unit and 36.92% of multiple unit) of prosthetic need. Age group of 6-12 years was reported lowest percentage of prosthetic needs i.e., 32 (25.74% of single unit and 6.93% of multiple units).

Discussion

The present study was undertaken with the intention of assessing the prosthetic status and prosthetic needs of mentally challenged individuals attending special schools in Nasik district.

In the present study, 20.56% of the subjects had prosthesis in upper jaw or lower jaw and both jaws. 18.88%, of the male subjects and 25.29% of the female subjects were having prosthesis in upper jaw or lower jaw and both jaws.

The assessment of prosthetic needs was significant step in oral health care planning. The present study reported high prosthetic needs Almost 73.16% of the subjects were in need of single unit, multiple unit or combined prosthesis. Savtum

Table 2: Age wise and gender wise distribution of prosthetic status, by type of prosthesis in both jaws.

Gender wise		Upper jaw		Lower jaw		Both jaw		
	Single unit	Multiple unit	Single unit	Multiple unit	Single unit	Multiple unit		
Male	8	2	11	5	7	5		
M=201	(3.98)	(0.99)	(5.47)	(2.48)	(3.48)	(2.48)		
Female	5	1	4	3	2	3	$X^2=0.46$	
F=71	(7.04)	(1.4)	(5.6)	(4.22)	(2.81)	(4.22)	$P=0.60$	$P=0.49$
Total	13	3	15	8	9	8	$CI=95\%$	$CI=95\%$
N=272	(4.77)	(1.1)	(5.51)	(2.94)	(3.3)	(2.94)		
Age group	Upper jaw		Lower jaw		Both jaw			
	Single unit	Multiple unit	Single unit	Multiple unit	Single unit	Multiple unit		
6-12 yrs	3	0	4	0	4	0		
N= 101	(2.97)	0	(3.96)	0	(3.96)	0		
12-18 yrs	3	2	3	3	4	3	$X^2=1.66$	$X^2=2.69$
N= 111	(2.70)	(1.80)	(2.70)	(2.70)	(3.96)	(2.70)	$P=0.43$	$P=0.26$
18 yrs above	5	3	4	4	7	4	$CI=95\%$	$CI=95\%$
N= 60	(8.33)	(5)	(6.66)	(6.66)	(11.66)	(6.66)		

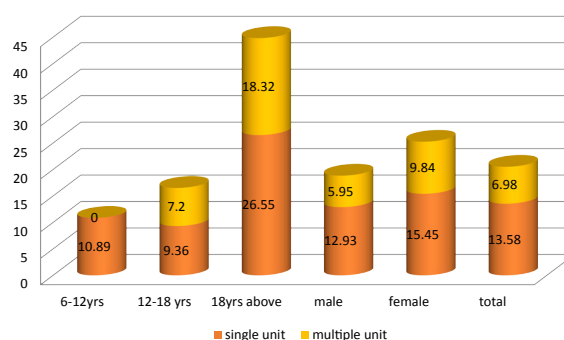


Figure 1: Percentage of the subjects having prosthesis, by type of prosthesis in both jaws.

Table 3: Age wise and Gender wise Distribution of prosthetic needs, by type of prosthesis in both jaws.

Age group	Upper jaw		Lower jaw		Both jaw		χ^2	P	CI=95%
	Single unit	Multiple unit	Single unit	Multiple unit	Single unit	Multiple Unit			
6-12 yrs N= 101	6 (5.94)	2 (1.98)	13 (12.87)	4 (3.96)	7 (6.93)	1 (0.99)			
12-18 yrs N= 111	16 (14.41)	13 (11.71)	18 (16.21)	17 (15.31)	15 (13.51)	11 (9.9)	$\chi^2=1.06$	$P=0.58$	$\chi^2=2.85$ $P=0.24$
18 yrs above N= 60	13 (21.66)	10 (16.66)	22 (36.66)	12 (20)	16 (26.66)	13 (21.66)	$\chi^2=3.25$	$P=0.19$	$\chi^2=0.81$ $P=0.36$
Gender									
Male M=201	23 (11.44)	12 (5.9)	34 (16.91)	24 (11.94)	26 (12.93)	13 (6.46)			
Female F=71	12 (16.9)	6 (8.4)	17 (23.93)	10 (14.08)	14 (19.71)	8 (11.26)	$\chi^2= 0.0039$	$P=0.95$	$\chi^2= 0.81$ $P=0.36$
Total N=272	35 (12.86)	18 (6.61)	51 (18.75)	34 (12.5)	40 (14.70)	21 (7.72)			

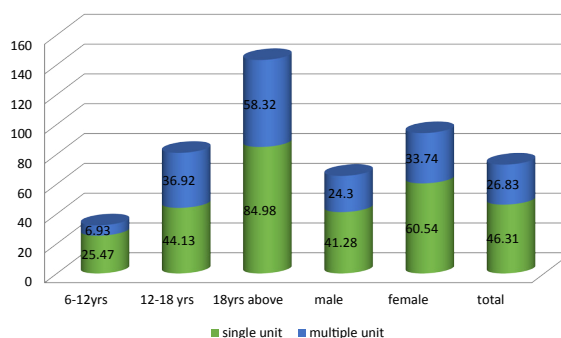


Figure 2: Percentage of the subjects requiring prosthesis, by type of prosthesis in both jaws.

and Heloe [11] reported slightly higher prosthetic status and needs compared to the present study. This may be due to the inadequate care provided in most of the institutions to prevent tooth loss primarily of lack of preventive programs and facilities for treatment under general anesthesia.

Since the number of female subjects was less in the study group, the prosthetic status and prosthetic needs was higher for female subjects as compared to male subjects. [15] Age group of 18 years and above reported higher prosthetic status and prosthetic needs followed by 12-18 years age group. This observation could be due to tooth loss is increases with advance age. It has been reported with previous study that, tooth loss increases rapidly with advancing age and mean number of teeth is found to decreases with increases in the age. [16,11] The percentages of edentulousness is also found to increase with age. [17]

In the present study, the need for single unit prosthesis (46.31%) was higher than multiple unit prosthesis (26.83%). Lower jaw

reported higher need of prosthesis (31.25%) than upper jaw (19.47%) and both jaws (22.42%).

Most important observation with the study is a strong deficit was observed between needs and availability of services in relation to prosthetic treatment as reflected by the prosthesis provided to these subjects despite of a large number of missing teeth. Gotowka, Johnson and Gotowka [12] investigated about cost providing Dental services to adult mentally retarded. The study reported that cost of the comprehensive dental service for mentally challenged individuals is higher than normal individual; hence the reimbursement structure must be reassessed to assure providers the ability to recover their costs. Medicaid reimbursement for dental services provided to eligible special patient groups (such as the adult mentally retarded) is the same as reimbursement for dental services provided to the eligible Medicaid population as a whole i.e., no fee differential is afforded the provider to compensate for the increased cost of producing services. A survey carried out by Russell GM and

Kinirons^[13] to measure attitudes and experience of community dental officers in Northern Ireland in treating disabled people and suggested that lack of experience and knowledge concerning the treatment of the disabled was commonest reason for not offering comprehensive dental care to the disabled.

The present study concluded that prosthetic needs (73.16%) of the mentally challenged individuals were much higher than prosthetic status (20.56%). It could be concluded that majority of these subjects remain without rehabilitation of oral functioning, this may be due to inability to cooperate, low priority to given to dental care, lack of motivation, poor socioeconomic status of the parents/guardians, higher cost of treating these subjects, lack of experience and knowledge of the dental professionals concerning the treatment of disabled etc.

Conclusion

It is observed from the results of the study that there is a high need of prosthetic care among mentally challenged individuals. There was strong deficit between prosthetic status and prosthetic needs. Oral health professional must apply positive approach to them. Apart from oral health education to parents of mentally challenged individuals. Centers of dental comprehensive treatment with experience oral clinician should be set up. Government should plan dental insurance policy for mentally challenged individuals, so the cost of the dental treatment can be reimbursed, which will reduce the economic pressure on parents. Further study is needed to collect the baseline oral health data of specific mentally challenged individual such as Down syndrome, autism, autism spectrum disorder and other mentally challenged problems, so to execute more relative treatment plan in relation to prosthetic needs.

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Conflict of Interest

All authors disclose that there was no conflict of interest.

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