

Oral Rehabilitation and Management of Mentally Retarded

JITENDER SOLANKI¹, JITENDRA KHETAN², SARIKA GUPTA³, DEEPAK TOMAR⁴, MEENAKSHI SINGH⁵

ABSTRACT

High level of periodontal problems of dental caries are frequently observed in mentally handicapped children. This group of patients presents various problems when they face dental treatments. Identification of such population and providing them affordable oral health care is the new concept. A systematic method for identification and screening of persons with mental retardation has been developed and is being followed. Cost and fear are the most commonly cited barriers to dental care. Physical or mental may lead to deterioration in self-care, and oral care state have a low priority. Risk factors are inter-related and are often barriers to oral health. With advancements in today's world sufficient information and support is available for each and every individual to lead a healthy life which include the access to the oral health care. Factors such as fear, anxiety and dental phobia plays a vital role in acceptance of dental care and also the delaying of dental care. Lack of knowledge of oral and dental disease, awareness or oral need, oral side-effects of medication and organization of dental services are highlighted in the literature. All health personnel should receive training to support the concept of primary oral health care. Training about dealing with such mentally handicapped people should be addressed urgently among the health professionals.

Keywords: Dental caries, Institutionalized, Mentally retarded, Oral health care, Oral hygiene

INTRODUCTION

Mental retardation (MR) refers to subaverage general intellectual functioning which originates during the development period and is associated with impairment in adaptive behaviour. General intellectual functioning means the results obtained by administration of standardized general intelligence tests for the purpose. The significant subaverage is defined as I.Q. of 70 or below on the standardized scale of intelligence. The adaptive behaviour is defined as the degree with which the individual meets the standards of personal independence and social responsibility in relation to his age and cultural environment [1]. The deficits in adaptive behaviour may be reflected in the three areas i.e. during infancy and early childhood, during childhood and adolescence and during late adolescence and adulthood [1].

Early in the 20th century, individuals with MR were generally isolated, rather than encouraged to lead fulfilling and healthy lives [2-4]. The last 40 y, however, have seen dramatic changes in sentiments regarding those with MR, resulting in a turn in public policy towards an emphasis on normalization and inclusion [5-7].

Oral and dental anomalies are a frequent accompaniment of mentally handicapped, which intern leads to improper functioning of stomatognathic complex. It has been reported that relatively poor oral hygiene and high level of periodontal disease in challenged children [8,9]. Dental diseases and its treatment present several problems in this group of patients. Large percentage of children with Down syndrome has a heart defect, dental caries or infection of the gingival or periodontal tissues may lead to bacterial endocarditis [10]. Simple dental procedures such as conservative or endodontic treatment may pose a serious risk. In mentally handicapped administering Anesthesia, either local or general should be done under strict observation. Several agents including ketamine and enflurane have been found to induce seizures and are therefore contraindicated in cerebral palsy [11].

Individuals with MR, have poor oral health as compared to the general population [12]. The oral health of the individuals with MR is associated with severity, aetiology, residential arrangements and age of the individual [13]. The prevalence estimates among those with MR reported in the literature, however, are subject to some

of the same problems as the prevalence estimates of other health conditions.

Identification of persons with mental retardation and affording them care and management for their disabilities is not a new concept in India. According to Persons with Disabilities Act (PWD), 1995 Mental retardation means a "condition of arrested or incomplete development of mind of a person which is specially characterized by sub-normality of intelligence". As a matter of need and above all as a matter of right, has had its recognition only in recent times, almost after the enactment of the Persons with Disabilities Act (PWD), 1995 [14].

Article 41 of the Constitution of India (1950) embodied in its clause the "Right to Free and Compulsory Education for All Children up to Age 14 y". Schools for persons with mental retardation were established including an integrated school in Mumbai [15]. According to NSSO (National Sample Survey Organization) currently there are more than 3000 special schools running in India.

The American Association on Mental Retardation (AAMR) also known as the American Association on Intellectual Disabilities (AAID). The AAMR 2002 definition reads "Mental retardation is a disability characterized by significant limitations, both in intellectual functioning and in adaptive behaviour, as expressed in conceptual, social, and practical adaptive skills, the disability originating before the age of 18 years.

The first large scale attempt to collect information on the prevalence of developmental delays was made in the 47th round of survey by National Sample Survey Organization (NSSO).

Screening Procedure

A systematic method for identification and screening of persons with mental retardation has been developed by the NIMH (National Institute for the Mentally Handicapped). They include pre-natal, neonatal and post-natal diagnostic procedures [16]:

1. Pre-natal Procedures
 - a. Blood tests for the pregnant mothers for any anemic condition, diabetes, syphilis, Rh incompatibility and neural tube defects in the foetal stage.
 - b. Ultrasonography (during pregnancy) is carried out in the

- second trimester of pregnancy to detect certain disorders, such as - neural tube defects, hydrocephaly, cerebellar lesions, etc.
- c. Amniocentesis is indicated in cases of foetal chromosomal aberration, congenital metabolic errors, severe Rh incompatibility etc.
- d. Chorionic Villous Sampling.
- 2. Neonatal and Postnatal Screening and Diagnostic Procedure.
- 3. Blood and urine examinations are conducted in the neonatal period in all suspected cases and with a previous history of mental retardation in the family or cretinism.
 - a. Apgar score at one minute after delivery.
 - b. Urine screening for metabolic errors -PKU (Phenyl Ketoneuria).
 - c. Blood biochemistry tests for cretinism, rickets, jaundice.
 - d. Blood antibody titres to detect infections.
 - e. Chromosomal analysis for Down syndrome, deletion of syndromes.
 - f. Neonatal neurobehavioural assessments.
 - g. Screening for visual impairments (visual acuity, fundus examination, and retinoscopy).
 - h. Screening for hearing impairments (Tympanogram, BERA.)
 - i. Ultra Sound Examination: To detect displacement of brain midline structures, thickness of brain substance, intracranial hemorrhage, etc in the newborn.
 - j. Biochemical Tests for identifying metabolic disorders.
 - k. Electro Encephalography (EEG): EEG is a useful diagnostic procedure for epilepsy, encephalitis, severe degree of mental retardation, etc.
 - l. Computerised Tomography (CT): CNS CT is useful to detect congenital anomalies like holoprosencephaly, agenesis of corpus callosum, Arnold chiari malformations, etc.
 - m. Magnetic Resonance Imaging (MRI): for intra-cranial pathology and structural abnormalities.

Screening Schedule I (NIHM National Institute of Mentally Handicapped) [16] [Table/Fig-1]

Stage Number	Child progress	Normal Development	Screening Schedule I If not achieved by the period
1	Responds to name / voice	1-3 months	4 th month
2	Smiles at others	1-4 months	6 th month
3	Holds head steady	2-6 months	6 th month
4	Sits without support	5-10 months	12 th month
5	Stands without support	9-14 months	18 th month
6	Walks well	10-20 months	20 th month
7	Talks in 23 word sentences	16-30 months	3 rd year
8	Eats/drinks by self	2-3 years	4 th year
9	Tells his name	2-3 years	4 th year
10	Has toilet control	3-4 year	4 th year
11	Avoids simple hazards	3-4 year	4 th year
Other factors			
12	Has fits	Yes	No
13	Has physical disability--what?	Yes	No

[Table/Fig-1]: Screening Schedule I (NIHM National Institute of Mentally Handicapped)

If an answer to any of the above items is 'yes', then suspect mental retardation.

- Compared with other children, did the child have any serious delay in sitting, standing or walking? Does the child appear to have difficulty in hearing?
- Does the child have difficulty in seeing?
- When you tell the child to do something, does he seem to have

problems in understanding what you are saying?

- Does the child sometime have weakness and/or stiffness in the limbs and/or difficulty in walking or moving his arms?
- Does the child sometimes has fits, becomes rigid, or lose consciousness?
- Does the child have difficulty in learning to do things like other children of his age?
- Is the child not able to speak at all? (Cannot make himself understand in words/say any recognizable words).
- Is the child's speech in any way different from normal? (Not clear enough to be understood by people other than his immediate family).
- Compared to other children of the same age, does the child appear in any way backward, dull or slow?

Selecting Appropriate Screening Measures [17]

For screening or an early detection program, appropriate screening measures must be selected.

- A screening device should meet the technical criteria of standardization, reliability, validity, and normative data.
- The screening instrument should also be culturally appropriate, acceptable to the participants and cost effective.
- Screening tests must have established sensitivity and specificity to be valid.

The World Health Organization (WHO), American Association for Mental Retardation (AAMR), American Association on Mental Deficiency (AAMD), International Classification on Deficiency (ICD), Diagnostic and Statistical Manual (DSM-IV) definitions of mental retardation relate to three levels of prevention [18]:

- Primary level of prevention is carried out by doctors and health professionals to prevent manifestation of the disability.
- Secondary level prevents the manifestations of additional disabilities and regression.
- Tertiary level mitigates the impact of disability on social isolation, stigmatization of the handicap.

Prenatal Prevention relates to-

- Dealing with causal factors such as Rhincompatibility; maternal illness, infections and other high risk conditions, such as malnutrition in mother and child during the first trimester of pregnancy, environmental and occupational hazards and consanguinity.
- Prenatal diagnosis where preliminary investigations are carried out, blood and urine tests investigations to assess the foetal abnormalities through ultrasonography, radiography, and amniocentesis.
- Immunization to the mother for preventing illnesses and infections leading to disability in the fetus.

Natal Prevention relates to-

- Delivery conducted under hygienic conditions by a trained person and/or in a hospital, to prevent breech delivery, asphyxia, prematurity with low birth weight, occurrence of jaundice, and other post-illnesses in the child.
- Care of new born at high risk for mental retardation in well equipped neonatal intensive care units; a close follow up to identify delays and abnormalities in development; facilitating intervention sand corrections at the earliest there by reducing the severity of handicap.

Postnatal Prevention relates to-

- Neonatal screening with simple blood and urine tests for metabolic abnormalities and hypothyroidism, associated conditions that lead to mental retardation.

Parent Training Programs

NIMH had initiated and conducted training programs for groups of parents. The intention in this model is to empower the parents and family members to look after their children with mental retardation as against providing expensive institutional support or residential programs [19].

The Persons with Disabilities Act, 1995

India was the first country to be a signatory to the Proclamation on the Full Participation and Equality of People with Disabilities in the Asian and Pacific Decade of Disabled Persons 1993-2002. In January 1996 an Act of Parliament enabling implementation of this Proclamation was passed The Persons with Disabilities (Equal Opportunities, Protection of Rights and Full Participation) Act, 1995. Two other legislations, the Rehabilitation Council of India Act, 1992 and the National Trust Act, 1999 have included training and guardianship respectively in their clauses [14].

Technology for People with Mental Retardation and Associated Disabilities Assistive Technology (AT) can be a device or a service. An assistive technology device is any item, piece of equipment, or product system that is used to increase, maintain, or improve functional capabilities of individuals with disabilities. An assistive technology service means any service that helps an individual with a disability select, acquire, or use an assistive technology device (Assistive Technology Act of 2004) [20].

Kelker (1997) developed the following is the list indicating that assistive technology may be considered appropriate when it does any or all of the following things [21]:

- Enables an individual to perform functions that can be achieved by no other means.
- Enables an individual to approximate normal fluency, rate, or standards – a level of accomplishment that could not be achieved by any other means.
- Provides access for participation in programs or activities which otherwise would be closed to the individual.
- Increases endurance or ability to preserve and complete tasks that otherwise is too laborious to be attempted on a routine basis.
- Enables an individual to concentrate on tasks – learning/employment, rather than mechanical tasks.
- Provides greater access to information.
- Supports normal social interactions with peers and adults.
- Supports participation in the least restrictive educational environment.

There is a complex interrelationship between socio-economic factors, illness, its treatment and oral health. Cost and fear are the most commonly cited barriers to dental care [22]. Both mental and physical illness cause deterioration of health and oral health is given least priority.

Such individuals should be informative and supportive so as to live a healthy and quality life with special care of oral health.

Factors which influence oral health, mitigate against self care and affect routine access and provision of oral care include [22]:

- Type, severity and stage of mental illness
- Client's mood, motivation and self-esteem
- Lack of personal perception of oral health problems
- Client's habits, life-style and ability to sustain self-care and dental attendance
- Environmental factors which mitigate against preservation of self-care

- Socio-economic factors which limit choices for healthy living
- Language and culture
- Lack of information on how to access information or dental services
- Oral side-effects of medication in particular the impact of xerostomia (dry mouth)
- Attitudes to oral care and knowledge of health professionals and health care workers
- Dental team's attitudes and knowledge of mental health problems
- Local dental personnel unable or unwilling to provide adequate dental care

Oral Symptoms Associated with Psychiatric Disorders

Oral symptoms such as excessive palatal erosion, facial pain, and self inflicted injury are commonly seen in mentally retarded patients [23]. Enamel erosion is frequently reported in patients with anorexia and bulimia [24]. A third of patients attending a temporomandibular joint dysfunction clinic had evidence of a mental disorder [25]. High rates of psychiatric disorders are reported in patients attending a specialist pain clinic [26]. Burning mouth syndrome includes anxiety and depression as an aetiological factors [27].

Mood, Motivation and Behaviour

These are important factors that influence compliance with oral self-care and all aspects of personal hygiene, this is particularly notable in individuals suffering from dementia or memory loss [28]. Lack of interest and low self esteem associated with the disorder are factors that contribute to inadequate self-care and regular dental attendance. Depression is also often associated with a disinterest in oral self care [29].

Ability to Accept Dental Care

This is related to a number of factors such as mood, motivation, self-esteem, ability to think logically, accept and understand the treatment plan, and ability to cooperate with dental treatment. Dementia affects an individual's ability to accept dental care [28]. Factors such as fear, anxiety and dental phobia plays vital role in acceptance of dental care and also the delaying of dental care.

Side Effects of Medication

Oral and systemic side effects of medication may prejudice oral health and give rise to patient management problems in planning treatment [30]. Reduction in salivary flow (xerostomia) is a frequently seen, as a result of which dental caries, periodontal problems, candidiasis, glossitis, stomatitis and parotitis are can be observed which in turn causes hindrance in chewing, speaking, trauma due to denture.

This may present as difficulty with speech, chewing, swallowing, poor denture tolerance, problems with retention and stability of dentures or denture trauma.

It is reported that subjects respond to xerostomia by an increased intake of candy and chewing gum to promote salivation and by a greater consumption of cariogenic fluid to slake their thirst [30,31]. Dyskinesia and dystonia are distressing side effect of long term anti-psychotic medication, characterized by abnormal, involuntary movement of the tongue or facial muscles, sometimes associated with abnormal jaw movements. Tongue protrusion and retraction, and facial grimacing are frequent presentations [32]. These symptoms pose problems for patient, career and the dental team in providing routine dental care [Table/Fig-2,3,4].

Level of Retardation	IQ Range		Approximate percentage of persons with mental retardation
	Stanford- Binet and Cattell Tests	Wechsler Scales	
Mild	52 – 67	55-69	89
Moderate	36 – 51	40-54	7
Severe	20 – 35	25-39	3
Profound	0 – 19	0-24	1

[Table/Fig-2]: Rehabilitation Council of India- Disability Development in India 2005, New Delhi.

Lifestyle Factors

Healthy lifestyle, attitudes to and value of oral health, knowledge of oral disease, inability or unwillingness to accept treatment, low perception of dental treatment needs and mistrust of dental health professionals contribute to poor oral health. Diet has a significant impact on both oral and general health. Poor diet and an increased sugar intake in drinks are reported [30]. Housing conditions, homelessness, and access to privacy for personal hygiene are issues which influence personal care. Alcohol and drug use adversely affect oral health and the combination of alcohol consumption and cigarette smoking poses a high risk for oral cancer [33]. In people who misuse alcohol, there may also be folate deficiency or anemia with glossitis, angular cheilitis or recurrent apthae [34]. Smoking leads to an increased incidence of periodontal disease, particularly necrotizing gingivitis, candidiasis and xerostomia. Erosion, cervical abrasion, gingival laceration and occasionally gingival necrosis and mucosal lesions are reported in oral cocaine users [35-37].

Professional Barriers

Attitudes to and knowledge of causes and effects of oral disease among health professionals and healthcare workers are issues

	Xerostomia	Drowsiness	Agranulo-cytosis	Tardive Dyskinesia	Tremor	Syncope	Hypo-tension	Thrombo-cytopenia	Immuno-suppression	Apathy
AMITRYPTILINE (TCA'S)	✓						✓	✓	✓	
BENZODIAZEPINES	✓	✓					✓			
CANNABIS	✓									
CHLORPROMAZINE (Largactil)	✓	✓					✓			✓
CHLORDIAZEPOXIDE (Librium)		✓								
CLOZAPINE	Hyper salivation		✓	✓						
DEXAMPHETAMINE SULPHATE	✓			✓						
DOTHIEPIN (Prothiaden)	✓									
FLUPHENAZINE DECANOATE	✓	✓		✓						
FLUOXETINE (Prozac)										Aggression
HALOPERIDOL	✓	✓								
LITHIUM CARBONATE	✓				✓	✓				
LOFEPRAMINE	✓			✓	✓					
METHYLPHENIDATE HYDROCHLORIDE (Ritalin)	✓				✓			✓		
MONO-AMINE OXIDASE INHIBITORS	✓						✓	✓	✓	
PROCHLORPERAZINE (Stemetil)	✓	✓		✓			✓			
PROCYCLIDINE	✓	✓								
PROMAZINE HYDROCHLORIDE	✓	✓								✓
RISPERIDONE	✓	✓								✓
THIORIDAZINE (Melleril)	✓	✓								✓

[Table/Fig-3]: The main side effects of drugs used in mental health that are relevant to the provision of oral care are listed below [32]

which need to be addressed in reducing barriers to oral health. The knowledge and skill of the dental team in managing patients with mental health problems has been cited as barrier [38]. Low tolerance on the part of dental staff in dealing with clients' lack of compliance with oral hygiene, care of prostheses and other issues and the unwillingness or inability of local dental personnel to provide adequate dental care is reported [39,40]. Dental team should be aware of the problems faced by mental handicapped, dentist should have good patient management skills, and a sympathetic attitude, these factors helps to develop a health relation with the mentally handicapped.

Professional Training

All health personnel should receive training to support the concept of primary oral health care [41]. Lack of knowledge of oral and dental disease, awareness or oral need, oral side-effects of medication and organization of dental services are highlighted in the literature [42-45]. Lack of formal training in oral health for professional careers is reported. Training programmes for health professionals both pre and post-qualification need to be urgently addressed.

Oral health professional should be well trained into knowledge, understanding about various conditions and its impact on the mentally retarded people and maintenance of oral health. Dental professionals should be updated with risks associated with drugs and treatments rendered to the mentally retarded patients. Improved behavioural management and communication skills can help the oral health professionals in providing quality oral health services to these people.

Oral Health Promotion

Preventive programmes need to be tailored to meet the individual needs with different diagnoses, prognoses, severity, stages of mental

Drug 1	Drug 2	Interaction
AMYTRIPTILINE	Anxiolytics & hypnotics Sympathomimetics Local anaesthetic with adrenaline	Enhanced sedative effects Potentiates drug 2 Increased heart rate and blood pressure
CANNABIS	Local Anaesthetic With Adrenaline	Abnormal response to local anaesthetic
CHLORPROMAZINE (<i>Largactil</i>)	Anxiolytics and Hypnotics Analgesics and Anaesthetics	Enhanced sedative effects Potentiation of drug 2
CHLORDIAZEPOXIDE (<i>Librium</i>)	Opioid Analgesic Antihistamine	Enhanced sedative effects
CLOZAPINE	CARBAMAZEPINE COTRIMOXAZOLE ANXIOLYTICS and HYPNOTICS	Increased incidence of agranulocytosis Increased incidence of agranulocytosis Enhanced sedative effects
DEXAMPHETAMINE SULPHATE	ADRENALINE	Possible hypertension
DOTHIEPIN (<i>Prothiaden</i>)	ANXIOLYTICS and HYPNOTICS	Enhanced sedative effects
FLUOXETINE (<i>Prozac</i>)	ANTICOAGULANTS (<i>Warfarin</i>)	Potentiation of drug 2
FLUPENTHIXOL DECANOATE (<i>Depixol</i>)	ANXIOLYTICS and HYPNOTICS	Enhanced sedative effects
FLUPHENAZINE DECANOATE (<i>Modecate</i>)	ANXIOLYTICS and HYPNOTICS	Enhanced sedative effects
HALOPERIDOL	CARBAMAZEPINE ANXIOLYTICS and HYPNOTICS	Accelerates metabolism Enhanced sedative effects
METHYLPHENIDATE HYDROCHLORIDE (<i>Ritalin</i>)	ADRENALINE	Possible hypertension
PROCHLORPERAZINE (<i>Stemetil</i>)	ANXIOLYTICS and HYPNOTICS	Enhanced sedative effects
PROCYCLIDINE	ANTIFUNGALS ANTIHISTAMINE	Reduced absorption Increased antimuscarinic effects
PROMAZINE HYDROCHLORIDE	ANXIOLYTICS and HYPNOTICS	Enhanced sedative effects
RISPERIDONE	ANXIOLYTICS and HYPNOTICS	Enhanced sedative effects
THIORIDAZINE (<i>Melleril</i>)	ANXIOLYTICS and HYPNOTICS	Enhanced sedative effects

[Table/Fig-4]: Side effects of medication affecting management or oral health Scully, C and Cawson, RA. Medical problems in Dentistry: Wright 4th Edn. 1998
Illustrates the interactions that are described in the referenced literature, which may occur between drugs used to treat mental illness and those used in dentistry. Drug 1 is the mental health drug, and drug 2 is a drug of dental relevance [32]

health and developed support and from the multidisciplinary team. Preventive advice for family members is paramount, which include instruction on the proper care and use of prosthetic devices for the needy. Advice on the importance of sugar free diet and to get relieve from the symptoms of dry mouth are essential to reduce the adverse oral side effects of anti-psychotic medication causing xerostomia.

Health promotion programmes developed in partnership with health, social and voluntary agencies should be client centered, tailored to meet their needs and with equal access [46]. It is reported that people with mental illness are often excluded from health promotion activities as they are perceived to be a nuisance [47]. The common risk factor approach with the dental team linking in to preventive programmes for promoting health is likely to be more effective, e.g.

- To promote good mental health (information on accessing services including dental services)
- To promote healthy eating including reduction of dietary sugars (dental decay)
- Smoking cessation policies (periodontal disease and oral cancer)
- Decrease alcohol intake (oral cancer, dental erosion)

It is recommended that an oral health needs assessment is included in general health assessment [48-50]. Such programmes provide the opportunity to include dietary advice which promotes general and oral health in the context of skills for daily living.

Coordinated Efforts–Governmental and Non-Governmental Organizations

In view of the vast multiplicity of agencies that would inevitably be involved in the implementation of the technology benefits to the persons with mental retardation, a coordinated and sustained effort is needed by both the governmental and non-governmental organizations [51].

A barrier-free environment is yet to be made available at all public places for persons with mental retardation and associated disabilities and locomotor disabilities.

- Facilities for comfortable travel even for short distances and for transporting the wheel chair are also not commonly available.
- Wheel chair usage, relating to postural stresses, calls for sustained research, development and design activities.
- Demand for walkers, motorized or self-propelled, may increase for use by persons with disabilities and the aged. Kerb-cuts and wheel chair usable roads and pavements are yet to be facilitated.
- Not all public buildings are disabled friendly. Provision of ramps, wide doorways, avoidance of split levels, provision of Braille signboards, toilet facilities, special locking and unlocking systems, are not prioritized or made mandatory.
- Only in specific situations and only as a result of litigations the transportation and conveyance – bus, rail and air has been made accessible to persons with disabilities.
- Possibilities of building wireless signals into lamp posts, signal posts which could provide positional, locational and directional information to road and pavement users through personal devices that incorporate navigational facilities are yet to make a beginning.

CONCLUSION

Identification of persons with mental retardation and affording them care and management for their disabilities is an urgent need of time. Attitude and knowledge of the oral health professionals and is of utmost importance while rendering the oral health care to mentally handicapped people. Dental team should be aware of the problems faced by mental handicapped, dentist should have good patient

management skills, and a sympathetic attitude, these factors helps to develop a health relation with the mentally handicapped. With the advancements that we see today it is important that full support and information should be provided to every individual to as to help him to live a better quality of life.

REFERENCES

- [1] Agarwal AK, Sharma VP. Rehabilitation Management of Mentally Retarded. *Indian Journal of Physical Medicine and Rehabilitation*. 2002; 35-38.
- [2] David HP. Mental health and social action programs for children and youth in the international perspective. *Ment Hyg*. 1970;54:503-09.
- [3] Rix B. A perspective of mental handicap. *J R Soc Health*. 1986;5:161-65.
- [4] Campbell VA. The Healthy People 2010 Process and People with Mild Mental Retardation: Difficulties Related to Surveillance and Data Collection. Monograph for the Centers for Disease Control and Prevention, 1999.
- [5] Rowitz L. (ed). *Mental Retardation in the Year 2000*. New York, NY: Springer-Verlag, 1992.
- [6] Kauffman JM, Hallahan DP. *The Illusion of Full Inclusion: A Comprehensive Critique of a Current Special Education Bandwagon*. Austin, TX:Pro-Ed. 1995.
- [7] Parmenter TR. Intellectual disabilities and the next millennium: the role of the International Association for the Scientific Study of Intellectual Disabilities (IASSID). *J Intel Disabil Res*. 1999;43:145-48.
- [8] Brown JP, Schodel DR. A review of controlled surveys of dental disease in handicapped persons. *J Dent Child*. 1976;43:313.
- [9] Tesini DA. Age, degree of mental retardation, institutionalization and socio-economic status as determinants in the oral hygiene status of mentally retarded individuals. *Community Dent Oral Epidemiol*. 1980;8:355-59.
- [10] Brown RH, Cunningham WM. Some dental manifestations of mongolism. *Oral Surg*. 1961;14:664-76.
- [11] Frassica JJ, Miller EC. Anesthesia management in pediatric&special needs patient undergoing dental and oral surgery. *In Anesthol Clin*. 1989;27:109.
- [12] Hart SL. Learning-disabled people's experience of general hospitals. *Br J Nurs*. 1998;7:470-77.
- [13] Grossman SA, Richards CF, Anglin D, Hutson HR. Caring for the patient with mental retardation in the ED. *Ann Emerg Med*. 2000;35:69-76.
- [14] Persons with Disabilities (Equal Opportunities, Protection of Rights and Full Participation) Act, 1995 Government of India.
- [15] Narayan J. School readiness for children with special needs. *NIMH*. Secunderabad 1999.
- [16] NIMH. *A Manual of Rehabilitation Workers Secunderabad*. 1998.
- [17] Persha, AJ. Brochure on early intervention series, *NIMH*. Secunderabad. 2000.
- [18] *Mental Retardation definition classification and system of supports* (9th ed.). Washington, DC: American Association on Mental Retardation.
- [19] Jha A. (1998). *Disability: A parent guide*, Indian Institute of Cerebral Palsy, Eastern India.
- [20] Public law 108-304- October 2004. 108th congress (HR 4278).
- [21] Kelker KA, Holt R. April 1997, Published by Parents Lets Unite for Kids.
- [22] Finch H, Keegan J, Ward K, et al. Barriers to the receipt of dental care, a qualitative study. *Social and Community Planning Research*. 1988.
- [23] Harwood P, Newton T. Dental aspects of bulimia nervosa: implications for the health care team. *Eur Eating Disorders Rev*. 1995;3(2):93-102.
- [24] Robb ND, Smith BGN, Geidrys-Leeper E. The distribution of erosion in the dentitions of patients with eating disorders. *Br Dent J*. 1995;178:171-75.
- [25] Morris, S, Benjamin, S, Gray, S and Bennett, D. Physical, psychiatric and social characteristics of the temporomandibular disorder pain dysfunction syndrome: the relationship of mental disorders to presentation. *Br Dent J*. 1997;182(7):255-60.
- [26] Hughes AM, Hunter S, Still D, Lamey PJ. Psychiatric disorders in a dental clinic. *Br Dent J*. 1989;166:16-19.
- [27] Lamey PJ. Oral medicine in practice: burning mouth syndrome. *Br Dent J*. 1989;167:197-200.
- [28] Whittle JG, Sarll DW, Grant AA, et al. The dental health of the elderly mentally ill: a preliminary report. *Br Dent J*. 1987;162:381-83.
- [29] Friedlander AH, Kawakami KK, Ganzell S, et al. Dental management of the geriatric patient with major depression. *Special Care Dentist*. 1993;13(6):249-53.
- [30] Stiefel DJ, Truelove EL, Menard TW, et al. A Comparison of the oral health of persons with and without chronic mental illness in community settings. *Spec Care Dentist*. 1990;10:6-12.
- [31] Barnes GP, Allen EH, Parker WA, et al. Dental treatment needs among hospitalised adult mental patients. *Spec Care Dentist*. 1988;8:173-77.
- [32] Scully, C and Cawson, RA. *Medical Problems in Dentistry: Wright 4th Edn*, 1998.
- [33] Harris CK, Warnakulasuriya KAAS, Johnson NW, et al. Oral and dental health in alcohol misusers. *Community Dent Health*. 1996;13:199-203.
- [34] Rothman KJ, Keller AZ. The effect of joint exposure to alcohol and tobacco and the risk of cancer of the mouth and pharynx. *J Chron Dis*. 1972;25:711-16.
- [35] Krutchkoff DJ, Eisenberg E, O'Brien JE. Cocaine induced dental erosions. *N Engl J Med*. 1990;320:408.
- [36] Friedlander AH, Gorelick DA. Dental management of the cocaine addict. *Oral Surg*. 1988;65:45-48.
- [37] Pary J, Porter S, Scully C, Flint S, Parry MG. Mucosal lesions due to oral cocaine use. *Br Dent J*. 1996;180(12):462-64.
- [38] Horst G. Dental care in psychiatric hospitals in the Netherlands. *Spec Care Dentist*. 1992;12:63-66.
- [39] Dicks, J. Outpatient dental services for individuals with mental illness: A program description *Spec Care Dentist*. 1995;15(6):239-42.
- [40] Stiefel DJ, Truelove EL, Jolly PE. The preparedness of dental professionals to treat persons with disabling conditions in long-term care facilities and community settings. *Spec Care Dentist*. 1987;7:108-13.
- [41] Sheiham A. The Berlin Declaration on Oral Health and Oral Health Services: Berlin Declaration Summary Report. *Comm Dent Health*. 1993;10(3):289-92.
- [42] Boyle, S. Assessing Mouthcare. *Nursing Times*. 1992;95(15):44-46.
- [43] Rak OS, Warren K. An assessment of the level of dental and mouthcare knowledge among nurses working with elderly patients. *Comm Dent Health*. 1990;7(3):295-301.
- [44] Eadie, DR, Schou, L. An exploratory study of barriers to promoting oral hygiene through carers of elderly people. *Comm Dent Health*. 1992;9:343-48.
- [45] Longhurst R. An evaluation of the oral care given to patients when staying in hospital. *Primary Dental Care*. 1999;6(3):112-15.
- [46] *Saving Lives: Our Healthier Nation (CM4386)* p123-127. The Stationary Office, July 1999.
- [47] Armstrong E. *Mental Health Issues in Primary Care*. MacMillan. 1995.
- [48] British Society of Dentistry for the Handicapped. Guidelines for oral care for long-stay patients and residents. 1999.
- [49] Griffiths JE. An oral health assessment carried out by nurses to identify older people needing advice and support in accessing dental services. Ageing in Changing Europe. III European Congress of Gerontology. Abstracts. *National Institute of Gerontology*, Utrecht. Abstract No 026.0807, 1995.
- [50] Griffiths JE, Williams J Risk factors for oral health in neuro-psychiatric patients in a rehabilitation unit. Japanese Soc Dent Handicapped. Abstracts/Proceedings - Supplement. 1998;19:347.
- [51] Nizami, A New approaches are required for amusing mental retardation. Proceedings of USEFI sponsored All India Workshop on Assessment in Special Education, MRIH, Calcutta. 2001.

PARTICULARS OF CONTRIBUTORS:

1. Assistant Professor, Department of Public Health Dentistry, Vyas Dental College & Hospital, Jodhpur, Rajasthan, India.
2. Assistant Professor, Department of Prosthodontics, Vyas Dental College & Hospital, Jodhpur, Rajasthan, India.
3. Post Graduate Student, Department of Oral Medicine Radiology and Diagnosis, Vyas Dental College & Hospital, Jodhpur, Rajasthan, India.
4. Consultant Orthodontist, ASG Dental hospital, Jodhpur, Rajasthan, India.
5. Assistant Professor, Department of Prosthodontics, Jodhpur Dental College & Hospital, Jodhpur, Rajasthan, India.

NAME, ADDRESS, E-MAIL ID OF THE CORRESPONDING AUTHOR:

Dr. Jitender Solanki,
Assistant Professor, Department of Public Health Dentistry, Vyas Dental College & Hospital, Jodhpur, Rajasthan, India.
E-mail: solankijitender@gmail.com

Date of Submission: **Sep 03, 2014**

Date of Peer Review: **Oct 20, 2014**

Date of Acceptance: **Oct 30, 2014**

Date of Publishing: **Jan 01, 2015**

FINANCIAL OR OTHER COMPETING INTERESTS: None.