

The dental health status of individuals with various mental disorders in Iran - A literature review

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Abstract:

Background and Aim: Dental health is one of the important aspects of people with a mental health condition needing special attention. Complications and symptoms of mental disorders can damage the dental health of mentally ill patients. This study reviewed patients' dental health status with mental disorders in Iran based on previous studies.

Materials & Methods: In order to review and extract the required results among the published articles and reports related to the subject under discussion, a systematic search was performed using Mesh terms

related in various national and international databases, including Web of Science, Science Direct, Scopus, PubMed, Google Scholar, Magiran and IranDoc in the period 2000-2021 according to PRISMA guidelines.

Results: The results of this study showed that the index of tooth decay (D) in patients with mental disorders is higher than healthy individuals in Iran. Based on the results of previous studies in Iran, it was found that the mean DMFT in patients with mental disorders was high. According to the results, in general, in patients with mental disorders, the average index of restored and filled

teeth (F) is lower than the average index of decayed teeth (D) and missing teeth (M).

Conclusion: Based on the present study results, it can be concluded that the dental health status of patients with mental disorders is unfavorable. Therefore, due to the special conditions of these patients in terms of the health status of their teeth, it is necessary to take special measures to improve the level of dental hygiene. Measures such as establishing special dental centers for these patients by the government, reducing costs related to dental restoration by dental centers, regular visits to patients' teeth, employing specialized and experienced staff to visit and repair decayed teeth, as well as educating parents and caregivers of patients with mental disorders can be effective in improving the dental health of these patients.

Keyword: Oral Health, Dental Health, Schizophrenic, Autistic, Patients, Children, Iran.

Introduction

Dental health is one of the most important aspects of public health, and not paying attention to oral health has a profound effect on the psychological and social aspects of life. Its problems reduce the quality of life, and people with mental health problems are at higher risk of oral disease [1, 2]. The concept of mental disorders has changed today compared to the past and includes conditions that affect people's emotions, cognition, and behavior [3]. One of the health problems of people is the prevalence of mental disorders among them [4]. It is estimated that 450 million people worldwide from different walks of life suffer from mental disorders [1]. According to a review study in 2005 [5] and a descriptive study in 2004, 27% and 25% of European adults experience psychiatric problems at least once during twelve months [6].

Epidemiological studies on psychiatric disorders have shown that the prevalence of mental disorders varies based on different sampling methods, interviews, and classification of diagnostic methods in different parts of the world [7]. Various studies in Iran show the prevalence of mental disorders in Lorestan province 19.05% [8], in Rudсар 17% [9], in Meybod 12.5% [10], in Kashan 29.9% [7], in Rasht 48.6% [11], in Gonabad 16.6% [12], in Tehran 21.5% [13].

Depression is an important and common disease that negatively affects our feelings and risks oral health [14, 15]. In addition, types of mental disorders damage the soft and hard tissues of the oral cavity through the use of drugs related to these diseases, and many people may not perform satisfactorily in their oral health due to the use of drugs that cause dry mouth [16].

DMFT is the best epidemiological indicator that indicates the dental health status of individuals in the community [17]. In this index, teeth are considered permanent (T = Teeth), decayed (D = Decay), missing due to decay (M = Missing) or restoration due to decay (F = Filling) [18]. Based on it, while determining the amount of caries and the type of treatments performed in the past, current treatment needs can be identified and play an important role in health decisions [18, 19]. Many studies globally reported that the health status of people with mental disorders is lower than that of healthy people, so that the DMFT in these studies varies in the range of 14.9-27.6 [20].

In addition, the risk of dental disease in psychiatric patients is higher than in other people. According to the results of previous studies, tooth decay was more common in mentally ill patients hospitalized for a long time [17-20]. Various factors, including side effects of drug use, lack of access to medical centers, fear, ignorance, and negative attitude of dental professionals,

can affect the oral health status of mentally ill patients [15].

Due to the importance of oral health and its psychological, social, and economic consequences on people's lives, especially patients with mental disorders, it is necessary to conduct more studies in this regard in Iran. In Iran, various studies have been conducted on the dental health status of patients with mental disorders. In the present study, using previous studies in Iran, the general status of dental health in patients with various mental disorders is investigated by a narrative review study.

Material & Methods

A systematic search of internationally available databases including Web of Science, Science Direct, Scopus, PubMed, and Google Scholar within July-2000 to August-2021 review and extract required results from published articles and reports. Systematic review using Mesh terms "Oral health", "Dental health", "Schizophrenic", "Autistic", "Patients", "Children", "Adults", "Iran", "Autistic spectrum disorder", "Psychiatric "Patients", "Dental patients", "Mental disorders", "Psychopathy", "Psychiatric disorders" and "Mental illness". For other databases, the same Mesh terms were used similarly. The references were thoroughly evaluated to verify that no articles were

missed for inclusion in the study (Reference Checking). In addition, the citations from the research were also checked (Citation Tracing) to make sure that the search was thorough and successful. Based on Figure1, literature was searched, and articles were received based on the PRISMA guideline [21]. In addition, unofficial reports, articles in a letter to editor format, and unpublished articles and content posted on Internet sites were removed from the list of downloaded files. Finally, the results of 12 published articles for the present review study were reviewed. In this study, two well-known indicators related to dental health status, including DMFT (Decayed, Missing, and Filled Teeth) and PUFA (Pulpal involvement, Ulceration caused by dislocated tooth fragments Fistula and Abscess) were used, which is used for permanent teeth. In addition to the above indices, dmft and pufa indices were used, which can be used for deciduous teeth. From the mentioned index, the components of these indices were also extracted, which include "D", "M", "F", "d", "m", "f", "P", "U", "F". ", " A ", " p ", " u ", " f ", " a ", " DMFT + dmft ", " D + d ", " M + m "and" F + f ". In addition, the dental decay treatment Index (DTI) was another indicator used in the present study. DTI indicates the number of restored teeth in the target group, obtained by dividing F by DMF [22-24].

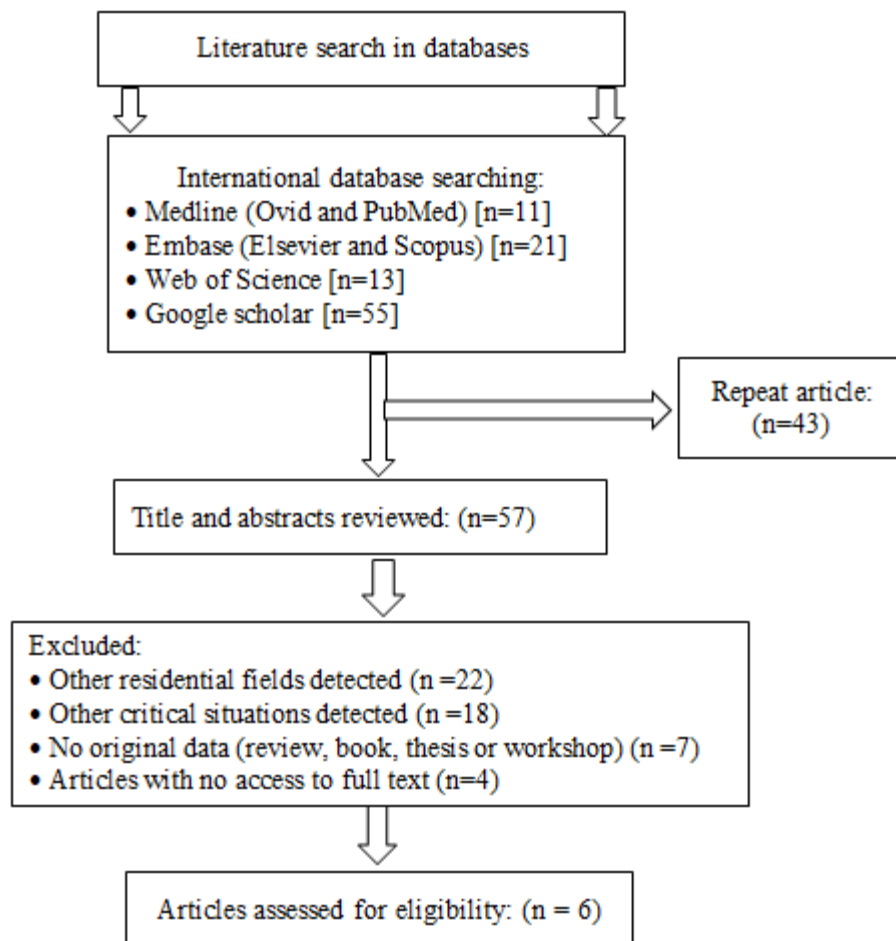


Figure 1: Flow diagram of study identification according to PRISMA.

Results and Discussion

Table 1 shows the results of studies on patients' dental health status with various mental disorders in Iran. Schizophrenia is one of the diseases related to mental disorders, so it is essential to pay attention to the health and teeth of this type of patient. Based on the findings presented in this table, Nikfarjam et al. (2011) reported that the mean DMFT index, mean decayed teeth (D), mean filled teeth (M), and mean filled teeth (F) in Patients with schizophrenia in Chaharmahal-Bakhtiari Province are 19.43 ± 0.71 , 11.24 ± 6.97 , 8.17 ± 8.30 and 1.1 ± 0.4 , respectively [25]. The results of Ebrahimi et al. (2021) study in Tabriz showed that the mean parameters of DMFT, D, M, and F are equal to 19.25 ± 7.35 , 6.43 ± 3.20 , 10.82 ± 7.66 , and 4.12 ± 2.0 [26]. In a similar

study, Mollashahi et al. (2014) in Sistan and Baluchestan province reported that the mean of the above parameters in patients with schizophrenia was 15.22 ± 6.62 , 6.86 ± 3.60 , 8.31 ± 6.89 , and 0.06 ± 0.45 [27]. Based on the results of previous studies in Iran on patients with schizophrenia, it was found that the mean DMFT in these patients is high, and measures should be taken to improve their dental health. In all three studies [25-27], the mean "F" was lower than the mean "D" and "M", indicating poor dental health in schizophrenic patients (Table 1).

The results of three studies on patients with schizophrenia in Iran [25-27] are similar to those of Gurbuz et al. (2010) [28] in Turkey. The similarity of the above results can be due to cultural, geographical, and

economic similarities. Also, the statistical population and the tools used in all four studies are very similar. While the mean DMFT of schizophrenia patients, in the studies of Bertaud-Gounot et al. (2013) in France [29] and Chu et al. (2010) in Taiwan [30], is less than reported in studies conducted in Iran [25-27]. The statistical population can explain this difference in results in the study of Taiwan and the better socio-economic situation of both countries. The results of some studies, such as Arnaiz et al. (2011) in Spain [31] and Persson et al. (2010) in Sweden [32], are not consistent with the results of studies conducted in Iran in terms of mean DMFT. This difference can be due to the subjects were selected from outpatients, and welfare indicators in the statistical population of both studies are more favorable than the statistical population of studies conducted in Iran. Mean DMFT in some other studies, such as Thomas et al. (1996) in Greece and Velasco et al. (1997) in Spain, was higher than the present study. This situation is due to the improvement of the level of oral health in European countries compared to Iran [33, 34].

Various factors can affect oral health in patients with mental disorders, especially patients with schizophrenia. These factors include age, duration of illness, smoking and substance use, poor eating habits, medications used for treatment, poor oral health, limited social relationships, economic poverty, low level of education, and some cultural issues [30, 35]. Therefore, a professional team is needed to improve the oral health status of patients with mental disorders. According to some studies, the lack of regular dental visits is one of the main factors in declining oral health in patients with mental disorders [30, 31, 33].

Based on a study by Nielsen et al. (2010), patients with schizophrenia need a dental visit on average about 30

days after admission due to a dental problem [36]. Providing conditions for regular and frequent examinations of patients with mental disorders, especially patients with schizophrenia, is the first step toward appropriate treatment and preventive measures. Using dairy products or pills containing probiotics and fluoride supplements can help prevent tooth decay. Nutritionists, dentists, and psychiatrists associated with patients with various mental disorders should consider reducing and preferably eliminating smoking and alcohol consumption and modifying the diet by reducing carbohydrate intake and increasing fiber intake. Due to the symptoms of dry mouth in these patients, specific antimicrobial and antifungal mouthwashes should be designed and produced with suitable compounds to reduce dry mouth. Health education for these people should be done with educational media such as film and animation and in simple language [30, 32-35].

Another important mental disorder is Autism Spectrum Disorder (ASD), which is as important to their dental health as patients with schizophrenia. In the Movahhed et al. (2017) study in Mashhad, the mean DMFT and dmft were 1.44 ± 1.11 and 2.24 ± 1.86 , respectively.

Based on the findings of the same study, the dmft / DMFT ratio in children with autism was not significantly different from healthy children [22]. In the study of Amrollahi et al. (2021) in Isfahan, PUFA and pufa indices were used, and the average of these indices in children with autism were 0.62 ± 0.29 and 3.43 ± 2.46 , respectively [23]. The results of Amrollahi et al. (2021) showed that the prevalence of tooth decay in children with autism was relatively high and dental health in children with ASD in the deciduous tooth system was worse than permanent teeth. Among the different components of the PUFA index, teeth with pulp involvement with an average of 0.27 had the highest

rate, and the average of wounds caused by dental parts was 0.01 [23]. Daneshvar et al. (2021) reported that the mean "DMFT + dmft" equals 6.33 ± 2.88 . In addition, based on the study findings mentioned above, the mean DMFT or dmft indices in children with ASD are significantly higher than in healthy children [37].

The results of studies conducted in Iran [22, 23, 37] are consistent with the results of some studies conducted in other countries and are not consistent with some other studies. Du et al. (2015) evaluated dental health in preschool children with ASD and concluded that the mean dmft index of dental decay in children with ASD was 3.73 and less than healthy children [38]. In addition, the studies of Loo et al. (2008) [39] and Namal et al. (2007) [40] have similarly reported a lower prevalence of tooth decay in children with ASD than in healthy children. Rekha et al. (2012) reported high dental decay rates in the deciduous dental period in children with ASD [41]. Jaber et al. (2011) also reported that the mean DMFT in children aged 6-16 years was 4.2, indicating a high prevalence of tooth decay in the studied population [42]. Findings of the Yashoda et al. (2014) study [43] showed that the rate of decay of deciduous teeth in children aged 4-15 years with ASD is higher than permanent teeth, which in this regard with the results of studies conducted in Iran [22, 23, 37] correspond. Marshal et al. (2010) reported that dental decay status in children with ASD was poor and considered autism as a factor in the high risk of decay [44].

Possible causes of tooth decay in children with ASD are higher than in healthy children, including poor chewing power and the use of medications that cause dry mouth in children with ASD [22]. In addition, studies reported lower rates of tooth decay in children with autism than in healthy children might be due to careful monitoring of parental and school teachers' nutrition and oral health in

children with ASD and lower sugar intake in these children [22, 45].

Based on the results of studies conducted in Iran and other countries, it can be said that care centers for children with autism and caregivers and parents of these children also play an important role in the prevalence of tooth decay in children with autism. For example, suppose the oral health centers have more trained and experienced staff, and there is regular monitoring of dental health. In that case, the rate of tooth decay will be less because children with autism cannot maintain personal hygiene due to physical and mental disabilities and are dependent on their caregivers in this regard. Also, a healthy diet and snacks in the care centers of children with autism are important in preventing tooth decay.

In addition to schizophrenia and autism, there are other disorders such as anxiety, moody, adjustment, ADHD, mental retard, neuropsychological disorder, and depression that fall into mental illness. Furthermore, due to the special conditions of these patients, their dental health may be inadequate, so efforts to identify problems related to their oral health are of particular importance, and in this regard, various studies have been conducted in Iran.

A cross-sectional study of Khadem et al. (2011) [24] on 130 mentally disabled children and 130 healthy children in Isfahan showed that the rate of tooth decay in the healthy and mentally retarded groups was 93.5% and 93, respectively. % Was. Also, the DMFT index in these two groups was 0.26 and 0.18, and the dmft index was 0.26 and 0.51, respectively. The treatment index of deciduous tooth decay (dti) in the mentally retarded and healthy groups was 0.18 and 0.97, respectively, while the DTI index was 0.14 and 0.13, respectively. Based on the results of the study [24], it was found that decay of

deciduous and permanent teeth is more in the disabled group than in the normal group and the dti index in mentally disabled children is much lower than normal children, although the DTI index in these two groups is approximately was similar. The results of Ajami et al. (2007) study in Iran showed that the rate of caries and periodontal disease in patients with disabilities is higher than normal people [46]. Batista et al. (2009) reported in Spain that the rate of caries in low-income children with low to moderate range is high, and due to lack of treatment interventions, the rate of restoration of decayed teeth in this group is low [47]. Borysewicz-Lewicka et al. (1996) Study in the USA showed that the rate of dental decay in people with mental retardation due to lack of primary health care is high [48]. In a study by Wolff et al. (2004) in the USA, it was reported that the rate of treatment services for the mentally retarded by dentists and specialist groups is low due to insufficient knowledge of how to treat this group of patients [49]. A study by Jeng et al. (2009) in Taiwan showed that people with intellectual disabilities do not receive services according to their needs and are not fully supported by insurance policy makers. The study considers the importance of family and policy makers and oral health personnel in providing health care to these disabled people [50]. Thornton et al. (1989) reported in the USA that the dental health status of the disabled group is very poor and that preventive dental programs are necessary to improve the dental health status of this group [51].

Morowatisharifabad et al. (2021) [52] analyzed data from a cohort study of 2368 people in Yazd, Iran. This study evaluated patients' dental health status with various mental disorders (including depression, learning disabilities, memory impairment, and other psychiatric disorders). The results of this study showed that the

mean parameters of DMFT, missing (M), decayed (D), and filled (F) teeth were 20.99 ± 8.4 , 1.13 ± 11.12 , 1.96 ± 3.15 , and 3.9 ± 4.66 , respectively. Based on the results of this study, it was found that the DMFT index is undesirable among people with some mental problems (Table 1). In another study by Karimi et al. (2018) was conducted in Tehran, which the results of this study also showed that DMFT branches in patients with Moody, Anxiety, Adjustment, Psychedelic disorder, and ADHD were 14.4 ± 6.6 , 14.3 ± 5.3 , 14.8 ± 6.0 , 17.7 ± 6.4 and 7.6 ± 4.5 , respectively [53]. In the study of Ghaffarinejad et al. (2015), in Kerman, the DMFT index for acute and chronic psychiatric disorder patients was 18.34 ± 8.18 and 21.19 ± 7.33 , respectively [54]. In the study of Hashemi et al. (2012) in Kerman, the DMFT index for patients with mental retard was reported to be 5.49 ± 3.49 [55], while in the study Rezaie et al. (2015) In Shiraz, in patients with the neuropsychological disorder, the DMFT index was 23.7 ± 6.2 [56] (Table 1).

Based on the results of the above studies, the dental health status of patients with other mental disorders (in addition to patients with schizophrenia and autism) is not favorable. As mentioned above, patients with mental disorders are affected by their oral health due to the complications of these disorders. Therefore, educating patients with mental disorders and informing caregivers and their families to maintain oral health is essential. In addition, avoiding excessive consumption of sweets and smoking and encouraging brushing, mouthwash, and regular dental visits can improve patients' dental health with mental disorders.

Therefore, specialized treatment centers for patients with mental disorders in Iran are mandatory and unavoidable due to the current unfavorable conditions. Special dentists should be trained for dental treatments of these patients in short periods who, in addition to dental

treatment, are aware of the systemic conditions and side effects of their medications. It is necessary for the doctors of these medical centers to work closely with the dentists and to refer these patients in case of dental

problems in the early stages. The results of this review study can be used by health policymakers, therapists, and patient's families.

Table 1: The dental health status for individuals with various mental disorders in Iran.

Reference	Study area	Sample size	Age (year)	Type of disease	Key results			
					DMFT=	D =	M=	F=
Nikfarjam et al. (2011) [25]	Chaharmahal-Bakhtiari Province	123	38.8±10.5	Schizophrenic	DMFT= 19.43±7.71	D = 11.24±6.97	M= 8.17±8.30	F= 1.1 ± 0.4
Ebrahimi et al. (2021) [26]	Tabriz	40	45.0±13.3	Schizophrenic	DMFT= 19.25±7.35	D = 6.43±3.20	M= 10.82±7.66	F= 2.0 ± 4.12
Mollashahi et al. (2014) [27]	Sistan and Baluchestan Province	44	34.5±11.4	Schizophrenic	DMFT= 15.22 ± 6.62	D = 6.86 ± 3.60	M= 8.31 ± 6.89	F= 0.45± 0.06
Movahhed et al. (2017) [22]	Mashhad	70	9.7±1.36	Autistic	DMFT=1.44	D=1.13±0.	D/DMFT=0.87±0	F: NR
					dmft=2.24±1	d=1.45±1.	d/dmft=0.64±0.3	F: NR
Amrollahi et al. (2021) [23]	Isfahan	90	8.7±2.15	Autistic	PUFA=0.62	P=0.27±0.	U=0.01±0.1	f=0.07±0.
					pufa=3.43±2	p=2.46±2.	u=0.85±1.01	a=0.30±0.
Daneshvar et al. (2021) [37]	Rasht	55	9.32±2.33	Autistic	(DMFT + dmft) = 6.33±2.88	(D + d) = 5.78±3.21	(M + m) = 0.11±0.42	(F + f) = 0.44±1.07
Khadem et al. (2011) [24]	Isfahan	130	7-11	Mentally Disabled	dmft = 0.26±0.17	DMFT = 0.26±0.36	dti = 0.18±0.02	DTI = 0.14±0.02
Morowatisharifabad et al. (2021) [52]	Yazd	1340	48.2±9.2	Depression	DMFT= 21.04±8.1	D = 1.88±2.95	M= 15.28±11.1	F= 3.87 ±
		100		Learning disabilities	DMFT= 21.47±9.2	D = 3.67±5.07	M= 16.11±11.19	F= 1.69 ±
		118		Memory impairment	DMFT= 22.58±10.8	D = 2.42±4.08	M= 18.36±12.23	F= 1.80 ± 3.1
		810		Other psychiatric disorders	DMFT= 20.75±8.83	D = 1.91±3.1	M= 14.63±11.13	F= 4.21 ± 4.87

Continued- Table 1: The dental health status for individuals with various mental disorders in Iran.

Reference	Study area	Sample size	Age (year)	Type of disease	Key results			
Karimi et al. (2018) [53]	Tehran	530	37.0±6.1	Moody disorder	DMFT= 14.4±6.6	D = 7.5±4.8	M= 3.7±5.1	F= 3.2 ± 3.8
				Anxiety disorder	DMFT= 14.3±5.3	D = 6.7±4.0	M = 3.2±4.6	F = 4.3±3.8
				Adjustment disorder	DMFT= 14.8±6.0	D = 6.9±3.8	M = 3.9±4.6	F = 3.9±4.3
				Psychedelic disorder	DMFT= 17.7±6.4	D = 10.0±6.0	M = 5.1±5.7	F = 2.6±3.8
				ADHD	DMFT=	D =	M =	F =
Ghaffarinejad et al. (2015) [54]	Kerman	101	36.0±12.7	Acute psychiatric disorder	DMFT= 18.34±8.18	D = 7.78±3.8	M = 8.1±9.5	F = 3.6±2.9
		92	42.7±11.5	Chronic psychiatric disorder	DMFT= 21.19±7.33	D = 10.2±5.0	M = 14.7±9.7	F = 4.8±6.9
Hashemi et al. (2012)	Kerman	143	7-45	Mental retard	DMFT= 5.26±3.49	D: NR	M: NR	F: NR
Rezaie et al. (2015) [56]	Shiraz	80	53.7±6.3	Neuropsychological disorder	DMFT= 23.7±6.2	D: NR	M: NR	F: NR

NR: Not reported

Conclusion

Based on the present review study results, it can be said that in Iran, the rate of tooth decay in patients with various mental disorders is higher than in healthy individuals. One of the main possible reasons for this is the lack of regular visits by specialized dental centers. In addition, high dental costs and lack of financial resources prevent patients with mental disorders from going to dental treatment centers. Therefore, double cooperation and special attention to this group of patients are needed immediately and effectively to improve their oral health. Otherwise, due to the nature of disorders related to mental illness, the patient is not aware of his condition, and with the cooperation of dentists and relevant institutions, this will lead to worse physical and mental conditions for these patients.

Finally, it can be concluded that educating patients with mental disorders and informing caregivers and their families is essential for oral health. Furthermore, avoiding excessive consumption of sweets and smoking and encouraging brushing, mouth-washing, and regular dental visits can improve patients' dental health with mental disorders.

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