DMFT Index in a Tertiary Care Center in Amman, Jordan

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Abstract

Aim: To quantify and set a baseline for DMFT index for patients examined at a tertiary care educational hospital in Amman, Jordan.

Material and method: This Study was conducted in a tertiary care center in Amman, Jordan in august 2016. Around one thousand five hundred patients' files were examined in this study.

Results: A total of 1498 records were included, age ranged from six to ninety-six years old with 810 females and 688 males. DMF index ranged from 0-32 with an overall average of 12.83. The difference between males and females was not statistically significant. For the mixed dentition group, ages from six to twelve years old, the average DMF was just below 2.

Conclusion: The DMF index data in this study showed that dental caries in Amman is still a health problem that requires action at a national level. This should also be reflected in DDS curriculum to further emphasize the need to analyze caries' risk and adopt a preventive approach to oral diseases.

Keywords: Oral Health, DMFT.

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Introduction

The combined efforts of clinicians and local health authorities are of paramount importance to ensure optimal oral health for a society. Local communities need to have access to dental care for prevention and treatment and clinicians must deliver appropriate dental services. However, data regarding disease prevalence and severity in the target population is needed to plan the infrastructure required to achieve these goals.[1]

The DMFT index, the sum of decayed, missing, and filled number of teeth, is first introduced by Klein et al. [2] The index is a cumulative caries measure, which indicates caries, including past and present carious teeth.[3] DMFT has been used to assess the dental caries status at the society level. This data is used to guide public health planning and policy-making purposes.[3]

As established by World Health

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Organization (WHO) and Federation Dentaire International (FDI), the goal is that by the year 2000, children reaching the age of 12 will not possess an average of more than three decayed, missing, and filled permanent teeth (DMFT). [4] Most high-income countries reached or even exceeded these goals, but for many low-income countries, this remains a work in progress (WHO, 2000). In 2003, the FDI, WHO, and International Association for Dental Research (IADR) issued ''Global Goals for Oral Health 2020''. [5] The aim of these goals is to provide guidance for local, regional, and national planners and decision makers to improve the oral health status of their populations. Those goals are not meant to be numerically specific. Each community could specify its own targets based on current disease prevalence and severity, local priorities, and oral health systems. [5]

Jordan is among four countries observed to have a higher DMFT for 12 year old children than the target recommended by WHO in 2000 [DMFT = 3]. DMFT of the Jordanian children of 12 year old population averaged 3.3 while Egypt and Sudan has the lowest DMFT average, 0.4 and 0.5 respectively. [6]

This current work attempts to quantify DMFT index for patients examined at a tertiary care educational hospital in Amman, Jordan.

Materials and Methods:

This Study was conducted in a tertiary care center in Amman, starting in August 2016. The Dental section of the Jordan University Hospital is one of the main referral centers in the capital city of Amman, where about half the population of Jordan reside, and which has a large proportion of its residents originally belonging to other geographic areas of Jordan, according to the 2015 Population and Housing Census conducted by the Department of Statistics in Jordan.

The overall sample size was determined to be 1500 files, accounting for almost half of the patients examined yearly in this center. Appropriate ethical approval was obtained from the Ethical Committee at the School of Dentistry, The University of Jordan prior to the commencement of the study. This project has been conducted in full accordance with the World Medical Association Declaration of Helsinki. All participants and the parent /guardian of participants under 18 were consented via a written form. All patients seen at the teaching clinic of the dental section sign a consent form to allow the anonymous use of their records for research or auditing. The consent procedure was approved by the ethics committee/institutional review board.

The files that were selected include patient's name, age, gender, medical and dental history with a detailed teeth charting. Clinical examination was conducted by a clinical dental student and co-signed by two trained dental health providers.

Data was collected by four dentists over duration of five months and tabulated using Microsoft Excel. Prior to the start of the data collection phase, these dentists were trained on how to record the caries prevalence using the dmft index for primary teeth and the DMFT index for the permanent teeth for ages older than 13 years.

Results:

A total of 1498 records were included, the records were assorted and regrouped according to age and gender; age ranged from 6 years old to 96 years old with 810 females and 688 males as shown in Table 1. The largest group was females between 21 and 30 years old (almost 12.5%), and the smallest was the female group older than 70 years (less than 1%). The Female

group between 13 to 60 years old was larger than the male group, but for those less than 12 years or more than 61 years old, males were more than females.

Table 2 shows DMF index component averages as calculated for each age group and gender subgroup. DMF index ranged from 0-32 with an overall average of 12.83 with insignificant difference between males and females. Females were found to have less decayed and missing teeth but more filled teeth as shown in Figure 1.

The number of patients with no decayed teeth was 275, while 659 patients had no fillings, 463 patients had no missing teeth and 70 patients are completely edentulous. Table 3 shows the distribution details of these records according to age groups. Collectively 102 records had zero DMF index; 85.3 % (87) of them are younger than 30 years old. While 78 records had 32 DMF index; 88.5% (69) of them are older than 50 years old. Figure 2 and 3; show the DMF index averages and count respectively according to the age groups when special conditions are applied such as no carious teeth, no missing teeth and no filled teeth. The main reason accounting for a 32 DMF index is the missing teeth component, 89.7% of them are completely edentulous as can be seen in figure 3.

Discussion:

Average DMFT index across all ages and both genders is around 12.83. Decayed teeth and missing teeth contribute equally with an average of 5 teeth each, while on average 3 teeth had fillings per person. This demonstrates gross under treatment of the studied population. The need for preventive measures, more education, as well as earlier detection is evident by the number of decayed and missing teeth especially at younger ages as early as 20 years of age. The peak of incidence of decayed teeth is during ages of 20-40 with almost 6 decayed teeth per person; however the filled teeth in the same age groups are around only 4 filled teeth per person. DMF epidemiological studies of such a wide age range are sparse. A couple of similar studies were performed in Croatia; according to a survey conducted in the city of Zagreb in 1986 among 35-44 year-old adults, the DMF index was 16.2, while the DMF value in the oldest age group (over 64 years) was 20.[7] In 2003, the sample of 35-44 year-old population of the Sibensko-Kninska County had the DMF value of 21.7 while the elderly population (65-74) had it at 23.7.[8]

Our cohort has shown a discrepancy in the decayed and filled components of the DMF index according to gender and age groups. Females had less caries experience and more filled teeth at the ages of 21-40 compared to males in the same age groups. However after the age of 60, females exhibit a similar pattern to males whereby missing teeth constitutes the majority of the DMF index with an average of 18 missing teeth. This trend might be attributed to either increasing tendency toward more aggressive treatment modalities, or possibly patients' lower social activities, which lead to less access to dental care.

For the mixed dentition group; ages from 6-12, patients had around 2 permanent decayed teeth, and no missing nor filled teeth, the average DMF is just below 2, which is better than the 3.3 reported for the same age group in another study [6] or the score of 4 that was reported back in the 90s.[9-12] Regarding the deciduous teeth deft index average is 6, with around 5 decayed teeth and 1 exfoliated or filled

tooth. These numbers indicate the need of national preventive measures as well as need for active treatment.

Another indication of good oral health is having no disease; no carious teeth. 275 of our patients had no caries, accounting for about 18% of the sample. An increasing pattern can be observed in the M component after the age of 30. On the other hand, the filled component has a single peak at the mid ages (21-50) which indicates that patients at older age present later for treatment, when teeth have to be extracted or are not willing to spend time and money for more conservative treatment plans and that result in more extractions and extra emphasis on prosthetic options.

Forty four percent of the sample had no filled teeth while only one tenth (10.5%) had no filled or decayed teeth. The number of decayed teeth when the patient had no filled teeth is almost constant until the age of 50. A decrease in the D component after the age of 50 while the M component increases rapidly, this supports our previous suggestion regarding patients' goals of dental treatment according to age.

Several papers discussed the use of DMFT index as an indicator for the oral health status. [13-15] The different stages of dental caries are not differentiated in the DMFT index. "Without radiographs, there is 44% probability that the caries decay value will be lower than the actual value".[13] Other indices to describe oral health status are; significant caries index (SiC), or a modified DMFT with radiographs. The Significant Caries Index (SiC) was introduced in 2000 to bring attention to the individuals with the highest caries values in each population. It represents the mean DMFT for the population with the highest caries scores in the study sample. [16] DMFT index was used in this study in order to be able to compare it with previous or future studies.

This paper highlights the need for further emphasis on patients' education regarding the caries prevention and attending regular dental checkup appointments. Dental awareness campaigns, especially oriented to educate the patients on when and how often they should visit the dentist, are an important factor in decreasing the DMFT index. The efficacy of daily or twice daily brushing with fluoride toothpaste for the prevention of dental caries is supported by a randomized clinical trial.[17]

Further on, supervised tooth brushing exercises implemented in schools is a good way to maintain and stress on the importance of maintaining a good oral hygiene. [18,19] A study was based on the use of fluoridated toothpaste in a supervised tooth brushing program in schools in southern Thailand showed significant impact on caries incidence resulting in reductions of up to 34% reductions in caries for all schools included in the study.[20]

On the other hand, dentists should concentrate on the preventive measures in treatment planning. This can be achieved by increasing the "contact" hours for the preventive dentistry in the DDS curriculum for the clinical students in the fourth and fifth year of their study.[21]As can be noticed in current curriculum at the school of Dentistry, The University of Jordan, the clinical students spend around (an hour) practicing preventive dentistry per week, while theoretical knowledge in that area is administered for (4 hours) per week in the preclinical stage.[22]

Further longitudinal studies are required to follow up the same sample and compare the

DMFT components after the completion of the treatment and maintenance phase of the treatment. More studies are required for the mixed dentition subgroup with a larger sample size, in a more comprehensive fashion on a national level. The use of a modified DMFT with radiographs would overcome the limitations of DMFT that tends to underestimate the need for restorative care. Also, further studies that focus on the risk factors for high DMFT index such as dietary, oral hygiene habits, and BMI would be instrumental in planning preventive protocols.

Conclusion:

The establishment of dental health and DMF index databases and the appropriate understanding of factors that lead to occurrence of dental caries are important for objectives to be set and preventive programs to be planned in the domain of oral health. The implementation of programs and actions towards oral health promotion and dental caries prevention, if started at national level, should lead to changes and demonstrate the importance of preventative approach, encouraging also the revitalization of the preventive dental health care among pre-school and school children. This should also be reflected in our DDS curriculum to further emphasize the need to analyze caries risk and adopt a preventive approach to oral diseases.

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Table.1 shows distribution of the study sample based on age ranges and gender.

Age range	F	M	F:M	Total
06--12	86	102	0.84	188
13--20	110	91	1.21	201
21--30	188	135	1.39	323
31--40	132	104	1.27	236
40--50	130	82	1.59	212
51--60	116	78	1.49	194
61--70	37	65	0.57	102
>70	11	31	0.35	42
06 -- 96	**810**	**688**	**1.17**	**1498**

Table 2. shows DMF index component averages as calculated for each age group and gender subgroup.

Age range	D			M			F			DMF index AVG		
	M	F	Total	M	F	Total	M	F	Total	M	F	Total
06--12	1.64	1.42	1.54	0.1	0.07	0.09	0.21	0.38	0.27	1.96	1.83	1.9
13--20	5.85	4.59	5.16	1.69	1.91	1.81	0.84	2.01	1.48	8.37	8.51	8.45
21--30	6.89	5.4	6.02	2.09	2.29	2.21	1.74	2.94	2.44	10.7	10.63	10.66
31--40	8.02	5.11	6.39	3.79	4.76	4.33	2.55	4.11	3.42	14.36	13.95	14.13
40--50	5.85	5.08	5.38	7.96	6.32	6.96	2.85	4.28	3.73	16.67	15.69	16.07
51--60	4.17	3.92	4.02	11.91	10.5	11.07	2.94	4.29	3.75	19.01	18.72	18.84
61--70	3.22	2.38	2.91	17.26	15.84	16.75	2.26	2.76	2.44	22.74	20.97	22.1
>70	1.71	2.27	1.86	23.26	17.09	21.64	1.35	3.55	1.93	26.32	22.91	25.43
06 -- 96	5.13	4.38	4.72	6.2	5.05	5.58	1.82	3.14	2.53	12.56	13.15	12.83

Table 3 shows the distribution details of patients with D:0, M:0,F:0, DMF:0,DMF:32, and M:32 according to age groups.

Age range	D=0	M=0	F=0	DMF=0	DMF=32	M=32
06--12	76	176	156	63	0	0
13--20	27	97	110	13	0	0
21--30	26	116	121	11	0	0
31--40	19	40	67	6	2	2
40--50	20	19	58	4	7	5
51--60	35	6	64	0	20	17
61--70	48	7	56	4	26	24
>70	24	2	27	1	23	22
06 -- 96	275	463	659	102	78	70

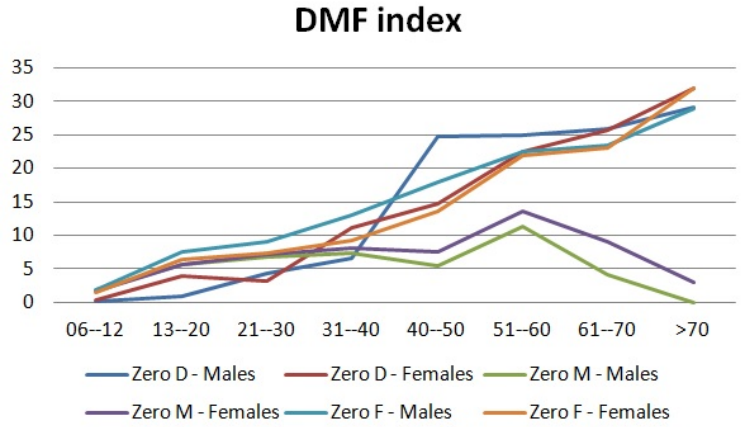

Figure 1 shows DMF index component averages as calculated for each age group and gender subgroup showing the D and M component for each subgroup.

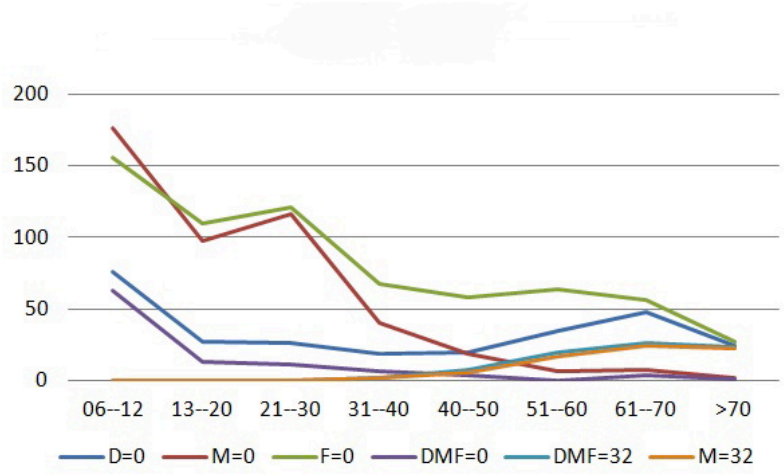

Figure 2 shows the distribution of DMF averages of patients with D:0, M:0,F:0 according each age group and gender subgroup.

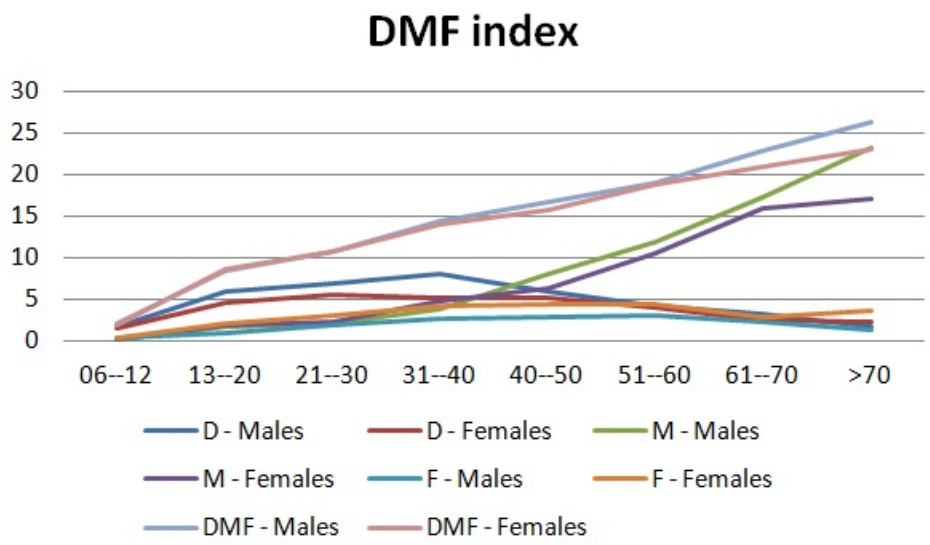

Figure 3 shows number of patients with D:0, M:0,F:0, DMF:0,DMF:32, and M:32 according each age group and gender subgroup.

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مؤشر الاسنان المنخورة والمفقودة والمحشوة (DMFT) في مركز الرعاية الثالثية في عمَان، الاردن.

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الملخص

هدف: تحديد ووضع خط الأساس لمؤشر الأسنان المنخورة والمفقودة والمحشوّة (DMFT) للمرضى الذين يتم فحصهم في مستشفى رعاية ثالثية تعليمي في عمّان، الأردن.

مواد وأساليب: تم اجراء هذه الدراسة في مركز الرعاية الثالثية في عمّان، الأردن بدءا من شهر آب للعام 2016. حيث تم فحص حوالي ألف وخمسمائة ملف في هذه الدراسة.

نتائج: تمّ ضم 1498 سجل بالإجمال، 810 أناث و688 ذكور، تراوحت الأعمار من 6–96 عام، وتراوح مؤشر ال (DMFT) من 0–32، وكان المتوسط يبلغ 12.83. لم يكن الفرق بين الذكور والاناث معنوي احصائيا. وكان مؤشر ال (DMFT) للمجموعة التي يتراوح عمرها من 6– 12 سنة (مرحلة الاسنان المختلطة) أقل من 2.

استنتاج: اظهر مؤشر ال (DMFT) في هذه الدراسة أن تسوس الاسنان في عمّان ما زال يشكل مشكلة صحية تحتاج لتدخلات على المستوى الوطني. ويجب ان تنعكس هذه المشكلة على المنهاج المدرسي لتخصص دكتور في جراحة الاسنان، وذلك لتأكيد الحاجة لتحليل خطر التسوس وتبني منهاج وقائي للأمراض الفمية.

الكلمات الدالة: صحة الأسنان، مؤشر الأسنان المنخورة والمفقودة والمحشوة.