ISSN 2305-9664

Journal of Contemporary Dental Sciences

Volume : 06, No : 02

July, 2018

Contents

An Official Publication of Sapporo Dental College, Dhaka, Bangladesh
Recognized by Bangladesh Medical & Dental Council (BM&DC)

ISSN 2305-9664

Journal of Contemporary Dental Sciences (JCDS)

Recognized by Bangladesh Medical and Dental Council (BM&DC)

Vol. 6, No. 2, July, 2018

An Official Publication of Sapporo Dental College Uttara, Dhaka

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Graphics Idea : Maruf Hussain, SDCH

Publication of Sapporo Dental College and Printed at
IDEA Printers, Katabon, Dhaka. 02-9662116
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4. Jarett RJ. Insulin and hypertension (Letter). Lancet 1987; 2: 748- 749
5. Banerji MA, Faridi N, Atulri R, Chiken RI, Lebovitz HE. Body composition, visceral fat, leptin and insulin resistance in Asian Indian men. J Clin Endocrinol Metab 1999; 84: 137-144 (Abstract)
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Editorial

We are pleased to publish Volume 6, Issue 2, of Journal of Contemporary Dental Sciences. We have included 5 original articles in this issue.

Goal oriented learning (GOL) is the current concept in teaching learning pedagogy. Lecture based methods are age old method in teaching which usually involves one sided presentation of topics, leaving very little room for discussion. Chowdury MTH et al. in their paper discussed their experience and opinions of both students and tutors on the GOL method compared to lecture- based teaching.

Miah MNA et. al in their paper described the oral health status and tooth brushing practices among school going adolescent urban children in Sylhet. Dr. MN Kabir in his descriptive study discussed the prevalence of common dental problems in dental OPD of Cox's bazaar medical college hospital, Bangladesh. Both these papers covered two major cities of Bangladesh, Sylhet and Cox's bazaar.

Dr. Husneara Rekha in her article 'Item analysis of MCQ, part of an assessment tool evaluation,' had an elaborate presentation on effectiveness of MCQ evaluation and assessment system.

We included the study findings of Dr. CS Bose and M Sarker in this issue. Their paper discusses issues regarding Non- Alcoholic fatty lives disease in type-2 diabetes mellitus. In addition An Overveiw on Protocol for Periodental Therapy by Dr. JU Mahmood has also been included in this issue.

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Journal of Contemporary Dental Sciences (JCDS)
An Official Publication of Sapporo Dental College, Uttara, Dhaka

Vol. 6, No. 2 **July, 2018**

Contents

Evaluation of perceptions and experiences of students and tutors in regards to Goal-Oriented Learning as a model of curriculum delivery in teaching Public Health among dental undergraduate students

MTH Chowdhury[1], SK Nath[2], AE Noor[3], CP Podder[4] , S Mahbuba[5]

Abstract

Background: *Goal-Oriented Learning (GOL) teaching methodology might increase dental students' skill to achieve desired public health goal.* ***Purpose:*** *The objective of this study is to explore the perceptions and experiences of students and tutors in regards to GOL system in comparison to traditional lecture method.* ***Method:*** *The study was conducted among all the 2nd year BDS students of Sapporo Dental College using Quasi-Experimental design. Intervention and control group were taught using GOL and lecture based method, respectively. Students and tutors perceptions and experiences were evaluated using modified course experience questionnaire and tutor response questionnaire.* ***Result:*** *Although most of the students of GOL system perceived that it contributes in developing their generic skill like improving problem solving, analytic and expression skill, majority of them reported that workload was heavy on them. Most of the students were satisfied relating to tutor role, facilities available and evaluation system in GOL group. Overall satisfactions were superior in GOL groups in comparison to lecture group among both students and tutors.* ***Conclusion:*** *The study reveals that majority of students and tutors gave more positive feedback regarding GOL experience and consider it superior than lecture-based system.*

Key Words: Curriculum, Tutor role, Lecture Method ***(J Cont Dent Sci 2018;6(2): 1-9***

Article Received: 18.02.2018; Article Acepted: 20.05.2018

Introduction

Public health is the branch of medical science where population or communities are in the focus of interest rather than the individual only.[1] In order to achieve desired health goal and to make a public health program successful, efforts from both public health experts and communities are essential. For that reason, public health experts should have sufficient skills to involve communities actively in all kind of health program.

Like other medical professionals, dentists have important role in improving oral and general health of the population by providing preventive and curative management. Poor dentist-population ratio (0.3 per 10000 people)[2] is responsible for lack of availability of basic dental treatment to large proportion of the community. Dentists should have necessary public health skills, which could be achieved by appropriate learning process.

Medical and dental education process should strive to promote the behavior of lifelong learning among the students, which ultimately facilitate independent and critical thinking skill. These type skills enable future health professionals to solve health problems of individuals and communities in real life scenario.[3] Therefore, a pedagogic approach is needed where students should be at the center of education and guided by setting specific learning goals. Thus, a goal oriented learning system has been proposed in this study for piloting among dental undergraduates.

Traditional lecture-based system is type of one-way communication where tutor or lecturer delivers his presentation on a particular topic and students passively receive it. This method is used to deliver information regarding a concept or fact to a large group within a short period time.

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Lectures are widely used method in many institutions of the world. The main disadvantage of this pedagogy is that there is very little chance of interaction between the students themselves and the teachers. Therefore, it discourages critical thinking and participation of students in learning process.[7]

On the other hand, GOL pedagogy might increase dental students' skills to achieve desire public health goal by active participation of the students. However, this kind of goal oriented Public Health Education strategy has never been tried and evaluated among dental undergraduates particularly in the field of dental public health in Bangladesh. Therefore, this study aims to explore the perceptions and experiences of students and tutors in regards to implementing the GOL system in comparison to traditional method.

Material and Methods

The study was conducted by using Quasi-Experimental design. Two groups were taken for the study intervention group and control group. The study was conducted in classroom setting among 2nd year BDS (Bachelor of Dental Surgery) students of Sapporo Dental College and Hospital, Uttara, Dhaka as whole population from June 2014 to October 2014. Students who did not give consent or who were absent during the selected module of the course and who did not take part or completed all evaluation tests and questionnaire were excluded from the study

Among the four tutorial groups in 2nd year BDS course, one group was randomly chosen as intervention or experimental group and rest of the three groups were chosen as control group. Two subjects from the intervention group and three subjects from the control group had been excluded because of incomplete participation into the course. The final numbers of subjects in intervention and control group were 20 and 61, respectively.

Ethical approval and permission for the research was taken from the authority of Sapporo Dental College and Hospital before conduction of the study. Each participant was informed in details about research methodology and informed written consent was taken from each respondent.

To explore the experience and perceptions of participating students regarding GOL system and traditional lecture based system, a Modified Course Experience Questionnaire was used. The Course Experience Questionnaire (CEQ), a standardized global index, was designed to measure quality of teaching and learning experience, which has been developed by Ramsden (1991).[4] To evaluate the experience of students regarding GOL and traditional lecture based system a slightly modified version of CEQ was used in this study including some items of Modified Qassim University Course Experience Questionnaire. Five points Likert response scale ranging from strongly agree to strongly disagree has been used in this questionnaire.[4,5] The number of item in this modified version of questionnaire was 29.

To explore the opinion and evaluation of the tutors regarding GOL system, a tutor response questionnaire was used. Five point Likert scale also used here.[4,5]

Learning modules for the selected dental public health topics were Primary Oral Health Care, Dental Health Education, School Dental Health Programme, Planning and Evaluation of Dental Health Services. For application of GOL and traditional lecture based strategy, necessary resources like relevant papers, updated journals and information resources like computer, Internet service and audio-visual aids were used. Interventional/Experimental group (n=20) was taught using GOL system and control (n=61) with traditional lecture based system.

GOL system were taught by four tutors under the guidance of Dr. Mohammad Tawfique Hossain Chowdhury, who had been trained in 'New Concepts in Public Health Education' and Problem Based Learning system at Radboud University, Nijmegen, The Netherlands. Traditional lecture based system were taught by other tutors of the department. Both GOL and traditional system of teaching were applied in tutorial session.

Experiences and perceptions regarding given education strategy was explored both from intervention and control group and also from the tutor at the end of the study. Modified Course Experience Questionnaire4 and Tutor response questionnaire5 were used in this regard.

Statistical package for Social Sciences (SPSS) for Windows version 17 was used to analyze the data.

Results

Most of the intervention group respondents reported that tutor motivated them in self-directed learning, appeared more concerned regarding understanding students' perceived difficulties during study and were hard working in making the subject interesting. However, in explaining the subject topics and giving feedback to students, almost similar experiences observed both in intervention and control group (Table 1).

Table 1: Perceptions and experiences of students regarding good teaching during delivery of GOL and traditional lecture based system

Items	Group	Strongly agree %	Agree %	Neutral %	Dis-Agree%	Strongly disagree %	I do not know %
The tutors of this course motivated me to self directed learning	Intervention	30	65	5	0	0	0
	Control	14.8	57.4	8.2	13.1	4.9	1.6
The staff made a real effort to understand difficulties I might be having with my work.	Intervention	25	65	5	0	5	0
	Control	13.1	70.5	9.8	3.3	0	3.3
The teaching staff normally gave me helpful feedback on how I was going	Intervention	20	75	0	0	0	5
	Control	24.6	67.2	8.2	0	0	0
My lecturers were extremely good at explaining things	Intervention	40	60	0	0	0	0
	Control	39.3	54.1	6.6	0	0	0
The teaching staff worked hard to make their subjects interesting	Intervention	30	70	0	0	0	0
	Control	29.5	50.8	9.8	9.8	0	0

Most of the respondents from intervention group agreed that tutors made it clear at the beginning what was expected from them (90%) and the students also had the clear idea about their expected goal (95%) (Table 2).

Table 2: Perceptions and experiences of students regarding obtaining clear goal during delivery of GOL and traditional lecture based system

Items	Group	Strongly agree%	Agree %	Neutral %	Dis-Agree %	Strong ly disagree %	I do not know%
It was always easy to know the standard of work expected by teachers	Intervention	5	70	20	0	0	5
	Control	9.8	65.6	13.1	8.2	0	3.3
I usually had a clear idea of where I was going and what was expected of me in this course*	Intervention	20	75	5	0	0	0
	Control	4.9	60.7	18	13.1	0	3.3
To do well in this course all I really need is the ability to find target information	Intervention	30	55	10	0	0	5
	Control	14.8	65.6	11.5	6.6	0	1.6
The staff made it clear right from the start what they expected from students	Intervention	10	80	5	5	0	0
	Control	11.5	57.4	26.2	1.6	0	3.3

* P - 0.05

Most of the intervention group participants agreed that the workload was too heavy on them. Furthermore, majority of the intervention group reported that they were not given enough time to understand things they should learn (Table 3).

Table 3: Perceptions and experiences of students regarding study workload during delivery of GOL and traditional lecture based system

Items	Group	Strongly agree %	Agree %	Neutral %	Dis-Agree %	Strongly disagree %	I do not know %
The workload was too heavy*	Intervention	50	25	0	20	0	5
	Control	23	34.4	16.4	26.2	0	0
I was generally given enough time to understand the things I had to learn*	Intervention	15	45	15	25	0	0
	Control	6.6	70.5	18	3.3	1.6	0
There was a lot of pressure on me to do well in this course	Intervention	25	45	20	10	0	0
	Control	29.5	44.3	13.1	13.1	0	0

* P - 0.05

Majority of the students from intervention group agreed that GOL system improved their generic skills, such as analytic and working ability as a team member, their expression skills and their ability to plan own work in comparison to traditional system (Table 4).

Table 4: Perceptions and experiences of students regarding achievement of generic skills during delivery of GOL and traditional lecture based system

Items	Group	Strongly agree %	Agree %	Neutral %	Dis-Agree %	Strongly disagree %	I do not know %
The course sharpened my analytic skills.	Intervention	30	60	0	10	0	0
	Control	13.1	57.4	23	4.9	0	1.6
The course helped me develop my ability to work as a team member*	Intervention	40	60	0	0	0	0
	Control	11.5	57.4	21.3	9.8	0	0
As a result of my course, I feel confident about tackling unfamiliar problems*	Intervention	40	60	0	0	0	0
	Control	8.2	49.2	18	23	0	1.6
The course improved my expression skills*	Intervention	55	40	0	5	0	0
	Control	11.5	44.3	14.8	29.5	0	0
My course helps me to develop the ability to plan my own work*	Intervention	40	45	10	5	0	0
	Control	11.5	57.4	19.7	11.5	0	0

Most of the study participants from Intervention group agreed that they were satisfied about the evaluation method of the course and they thought that it was fair (Table 5).

Table 5: Perceptions and experiences of students regarding assessment procedure during delivery of GOL and traditional lecture based system

Items	Group	Strongly agree %	Agree %	Neutral %	Dis-Agree %	Strongly disagree %	I do not know %
The staff seemed more interested in testing what i had understood	Intervention	10	70	20	0	0	0
	Control	14.8	62.3	19.7	3.3	0	0
Tutors asked me questions just about facts not concepts	Intervention	0	10	25	55	10	0
	Control	1.6	16.4	14.8	63.9	1.6	1.6
The evaluation system in the college is not student centered, as it does not reflect the improvement made by the student with the passage of time.	Intervention	0	25	30	30	5	10
	Control	1.6	14.8	11.5	50.8	8.2	13.1
I am satisfied about the method of evaluation of our course and i think it is fair. *	Intervention	30	65	5	0	0	0
	Control	3.3	73.8	16.4	6.6	0	0

* P - 0.05

Majority of the respondents in both groups were satisfied with the facilities available for the course, therefore, they developed more interest with the passage of time and ultimately they were overall satisfied with the quality of the course. However, intervention group member were more satisfied in comparison to control group (Table 6).

Table 6: Perceptions and experiences of students regarding overall satisfaction related to GOL and traditional lecture based system.

Items	Group	Strongly agree %	Agree %	Neutral %	Dis-Agree %	Strongly disagree %	I do not know %
I am satisfied with the facilities (books, internet) available for the course	Intervention	10	70	15	5	0	0
	Control	14.8	62.3	9.8	11.5	0	1.6
I develop more interest with the passage of time	Intervention	5	85	5	5	0	0
	Control	6.6	68.9	18	3.3	1.6	1.6
Overall, I was satisfied with the quality of this course	Intervention	40	55	5	0	0	0
	Control	18	73.8	8.2	0	0	0

All the students of intervention group reported that GOL system developed their problem solving skills. Most of them were satisfied about tutor role and evaluation method, assignment given and group dynamics during GOL course. All of them spent their time in preparing presentation during weekly problem solving. In addition, they mostly depended on books and GOL discussion groups as sources of information (Table 7).

Table 7: Perceptions and experiences of students regarding GOL system.

Items	Strongly agree %	Agree %	Neutral %	Dis-Agree %	Strongly disagree %	I do not know %
GOL course develop my problem solving skill so far	30	70	0	0	0	0
I was satisfied about- a) Tutor role in GOL session	25	75	0	0	0	0
b) Assignment given	30	65	5	0	0	0
c) My group dynamics	25	65	10	0	0	0
d) Tutors evaluation	30	70	0	0	0	0
For the weekly problem solving I spend my time in:						
a) Understanding the problem and finding objectives	20	75	0	5	0	0
b) Searching the literature	15	75	0	10	0	0
c) Preparing presentation	10	90	0	0	0	0
I depended mostly on the following sources:						
a) Books	35	65	0	0	0	0
b) Internet	30	65	0	5	0	0
c) Tutors and lectures	40	50	5	5	0	0
d) GOL groups	25	75	0	0	0	0
In my opinion, GOL system is better than traditional system	50	50	0	0	0	0

All the tutors agreed that students' expression skills were improved and they had achieved an acceptable level of understanding regarding subject topics/problems after GOL session. Moreover, majority of tutors reported that GOL course sharpened analytic skills among students, made them more goal oriented and interested in GOL activity with the passage of time. Finally, most of the tutors agreed that GOL system is better than traditional system (Table 8).

Table 8: Tutors evaluation and opinions regarding GOL system

Items	Strongly agree %	Agree %	Neutral %	Dis-Agree %	Strongly disagree %	I do not know %
The course sharpened the analytic skills of students	25	50	0	25	0	0
The students were more specific and goal-oriented with the passage of time	0	75	0	25	0	0
Students interest in GOL activity increased with the passage of time	25	50	0	0	25	0
The course improved student's expression skills	50	50	0	0	0	0
The students usually reach an acceptable level of understanding the problem/topics at the end of GOL session	0	100	0	0	0	0
In my opinion, GOL system is better than traditional system	50	25	25	0	0	0

Discussion

Goal-oriented learning (GOL) approach was evaluated in this study to see whether this pedagogy improve learner s skills and satisfaction during study of dental public health. GOL system adopted the approach of problem-based learning, therefore, it is an active learning process for the students where teachers act as facilitators. On the other hand, the more commonly used method of instruction is lecture based teaching that encourages passive learning where students try to memorize concepts instead of critically analyze and apply it in real life scenario.[6]

Four aspects of knowledge such as knowledge information related to concept and understanding, analysis and application of the concept had been evaluated between both GOL and traditional lecture based group. This study found that level of good score and mean knowledge score were significantly increased in GOL group in comparison to lecture group in post intervention evaluation. Similar findings were also observed in other studies.[7-10] Moreover, it may be due to fact that PBL method increase retention of knowledge.[11]

Like PBL method, GOL method fostered intrinsic motivation among students, helped them to understand, analyze and research the targeted concept through critical thinking process and ultimately guide them in action in applying the concept to address a public health issue by working together as a team.[5,12] This study also shows that most of the students agreed that GOL system improved their different cognitive skill like analytic and expression skills, problem solving skills, tackling unfamiliar problems, enhance working capability as a team member and planning of their own work.Shamsan (2009) also found similar findings among medical undergraduate in Saudi Arabia.[5] Furthermore, tutors in this study also agreed that GOL course improved the analytic and expression skills among students.

Majority of respondent from intervention group and tutor reported that GOL system had made the students more goal oriented and they had the clear idea of where they were approaching as expected. However, GOL group reported that workload was heavy on them. Similar observations also have been seen among medical undergraduates.[5]

Unlike another PBL study in a medical school of Saudi Arabia,[5] most of the GOL group participants reported in this study that tutors motivated them to self directed learning and hard working in making the subjects interesting. GOL system participants were also satisfied with the facilities available, tutor role and the evaluation system in this study.

Overall, both the students and the tutors were satisfied regarding learning experience with GOL system and most of them agreed that GOL system is superior than traditional lectured based system. This findings are consistent with findings of others study regarding PBL.[5,13]

Conclusion and Recommendation

In can be said that the need for public health approach is emerging in the field of dentistry to meet up the increasing need of the population. For this reason, dentists should be well equipped with necessary public health skills, which could be achieved by appropriate learning approach. GOL pedagogy had been for tried for the first time among dental undergraduates in Bangladesh. This study facilitates a platform for piloting and documenting the experience with this innovative teaching methodology. The outcomes of this study reflects that GOL system is more effective teaching method in comparison to traditional lecture based system in terms of increasing knowledge retention and skill in teaching public health to dental undergraduates. Moreover, the majority of the students and tutors reported that GOL system was superior to traditional system in regards to satisfying learning experience. Therefore, this study could be useful in teaching dental public health among dental undergraduates. However, more studies are needed to scale up this strategy to other discipline of dentistry.

Acknowledgements

This study was generously supported by the research fellowship offered by James P. Grant School of Public Health (JPGSPH) and funded by USAID as part of their Next Generation of Public Health Experts Project (NGPHEP).

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Original Article

Oral Health status and Tooth Brushing Practices among Urban School Going Adolescents in Sylhet, Bangladesh

MNA Miah[1], MAQ Mia [2], RI Smrity[3]

Abstract

Aims: *The aim and objectives of the study was to investigate tooth brushing practices and oral hygiene status of 15-years old school going children.* ***Methods:*** *This was a cross-sectional study on oral health condition among selected school children in Sylhet city. A two stage cluster sampling design was used. The study was carried out among 116 students aged 15 years studying in class IX. Data was collected by taking personal interview of the respondents.* ***Results:*** *Among 116 children, 72 (62%) were boys and 44 (38%) were girls. Overall DMFT index of the students was 1.68 where as the DMFT in dex of the boys was 2.08 and that of girls was 1.02. Among the respondents, 76.72% had normal gingival condition while 23.28 %had red or swollen gingiva. About four in every ten students (42.24%) brushed their teeth once in a day while about six in every ten (57.76%) respondents brushed their teeth twice or more than twice daily. Most of the students brushed their teeth with toothpaste and 74.77% students among them used fluoride containing toothpaste. Only 2.80% students stated that they did not use fluoride containing toothpaste and 22.42% students did not know whether their toothpaste contain fluoride or not. Most of the students (91.38%) brushed their teeth before breakfast. About six in ten students (59.48%) stated that they brushed their teeth after dinner.* ***Conclusion:*** *Urban school going children in Sylhet have good oral hygiene practices and have low DMFT.*

Key words: Oral health, brushing, caries.

J Cont Dent Sci 2018;6(2): 10-13

Introduction

The mouth and the teeth perform an essential set of functions, from the most basic eating and speaking, to more subtle social functions related to appearance and non-verbal communication.[1] Primary human dentition comprises of 20 deciduous teeth while permanent dentition comprises of 32 permanent teeth. Good oral health is not dependent on teeth alone; rather it extends to the health of the tissues supporting the teeth that is, the gums and the periodontium.[1] Dental diseases include dental caries, developmental defects of enamel, dental erosion and periodontal diseases. The main cause of tooth loss is dental caries in which diet plays an important role.[2] Dental caries is defined as a disease of hard tissue of the teeth caused by the action of microorganisms on fermentable carbohydrates-principally sugar for a period of time. Dental caries is a major problem affecting an estimated 90% of school children worldwide.[2] At the individual level, caries is a preventable disease. Given its dynamic nature, the disease once established, can be arrested or reversed prior to significant cavitations taking place. The carious process is essentially the same in primary and secondary dentitions.[3]

Oral health status in adult can be assessed by the presence or absence of dental caries by DMFT (DMFT, here D = decayed, M = missing, F = filled teeth) index which was introduced by Klein, Palmer and Knutson in 1938.[4] This index measures the prevalence of dental caries on teeth. Eating patterns and food choice among children and teens are important factors that affect how quickly youngsters may develop tooth decay. The reason is sticky film of bacteria, called plaque that constantly forms on teeth and gums.[5] The regular and proper cleaning and brushing of teeth is required to prevent decay and thereby prevent loss of teeth in children and adults.

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Good oral health is important because the experience of pain, problems with eating, chewing, smiling and communication due to missing, discolored or damaged teeth have a major impact on people s daily lives and well being.[6] Furthermore, oral diseases restrict activities at school, at work and at home causing millions of school and work hours to be lost each year throughout the world.[7] Children who suffer from poor oral health are 12 times more likely to have more restricted activity days including missing schools than those who don't.[8] Historically, most important global burdens of the oral health are dental caries and periodontal disease.[9] As dental caries is the most common dental disease with high prevalence, it is crucial to control the disease process by assessing and rendering the treatment required along with spreading awareness regarding its prevention. But for developing appropriate preventive approaches, anticipating utilization patterns and planning effectively for organization and financing of dental resources, the knowledge of oral health status and treatment needs of populations with different characteristics is important.

The school remains an important setting, offering an efficient and effective way to reach children and through their families and community member. School age is an influential stage in people's life when lifelong sustainable oral health related behaviors, as well a beliefs and attitudes, are being developed.[10] Children are particularly receptive during this period and the earlier the habits are established, the longer the lasting impact. Moreover, the massages can be reinforced regularly throughout the school years.[11] A variety of oral hygiene measures have been used since before recorded history. Tooth brush is an oral hygiene instrument to clean the teeth and gums.[12] The purposes of tooth brushing are to prevent the buildup of plaque that forms on the surfaces of teeth. Tooth brushing with a fluoridated toothpaste can provides benefit through the topical effect of fluoride and plaque removal from the tooth surfaces.[13]

The aim and objectives of the study was to investigate tooth brushing practices and oral hygiene status of 15 years students in Sylhet city.

Materials and methods

This was a descriptive type of cross-sectional study. The target population included all the 15 years students of class IX of all secondary school at Sylhet city in Bangladesh and the sample included 116 students of that city. A two-stage cluster sampling design was used to produce a representative sample of students. The first stage sample frame consists of all secondary schools of Sylhet city. The list of secondary school was taken from District Education Office. The schools were listed and two schools were selected from the list by lottery. The second stage sample frame consists of all students of class IX of the selected two schools. Data was collected by direct interview of the students and clinical examination. Clinical examination was done after taking verbal consent of the respondents. Data analysis was conducted by SPSS 15.0 software package. Statistical differences were determined by comparing the range of the 95% confidence interval.

Results

Total number of students of the school was 121 of whom 116 students responded. The response rate was 95.9%. Among those 116 students, 72 were boys and 44 were girls (Table I)

Table 1: Distribution of respondents according to gender

Category	Number of participants	Percentage (%)
Boys	72	62
Girl s	44	38
Total	116	100

Overall DMFT index of the students was 1.68 whereas the DMFT index of boys was 2.08 and that of girls was 1.02 (Table 2).

Table 2: Distribution of respondents according to DMFT level

Category	Number of participant	Total DMFT	DMFT index
Boys	72	150	2.08
Girls	44	45	1.02
Total	116	195	1.68

The gingival condition of most of the boys and girls was normal. About one-fifth of boys and about one-fourth of girls presented with abnormal gingival (Table 3.

Table 3: Percentage (95% CI) of respondents according to gingival condition (N=116).

Category	Normal gingival (%)	Diseased gingival (%)
Boy	79.17 (69.79 - 88.55)	20.08 (11.45 - 30.21)
Girl	72.73 (59.56 - 85.89)	27.27 (14.11 - 40.03)
Total	76.72 (69.03 84.44)	23.28 (15.99 30.97)

More than four out of ten boys and about same portion of girls brushed their teeth once a day. Less than six out of ten boys and more than half of the girls brushed their teeth twice or more a day. None of the boys or girls seldom or did not brush their teeth (Table 4).

Table 4: Percentage (95% CI) of respondents according to frequency of tooth brushing (N=116).

Category	Seldom or no brushing	Brushing once daily (%)	Brushing twice or more (%)
Boy	00	41.67 (29.02 - 57.82)	58.33 (46.94 - 63.72)
Girl	00	43.18 (29.02 - 57.82)	56.82 (42.08 - 71.45)
Total	00	42.24 (33.25 - 51.23)	57.76 (48.77 - 66.75)

Most of the boys brushed their teeth before breakfast (Table 5). About one in ten students brushed their teeth after breakfast. About six in ten boys and about half of the girls stated that they brushed their teeth after dinner.

Table 5: Percentage (95% CI) of respondents according to timing of tooth brushing (N=116).

Category	Before breakfast	After breakfast	After dinner
Boy	95.83 (93.29-98.38)	8.33 (7.85-9.09)	62.50 (51.32-73.68)
Girl	84.09 (77.46-90.72)	15.91 (14.28-17.54)	54.55 (50.33-58.73)
Total	91.38 (90.91-91.85)	11.21 (9.67-13.74)	59.48 (58.65-60.31)

Most of the boys and girls brushed their teeth with toothbrush and toothpaste (Table 6). Few students brushed their teeth with tooth powder and very few students clean their teeth with miswak.

Table 6: Percentage (95% CI) of respondents according to tooth cleaning practice (N=116).

Category	Toothpaste	Tooth powder	Miswak
Boy	91.67 (85.92-97.24)	5.56 (2.93-8.18)	2.78 (1.33-4.23)
Girl	93.18 (87.06-99.30)	4.55 (2.63-6.47)	2.27 (1.55-3.45)
Total	92.24 (86.76-97.69)	5.17 ((1.22-9.12)	2.59 (1.32-3.68)

About one-fourth of the boys and girls used fluoridated toothpaste to clean their teeth whilst very few boys and girls used toothpaste without fluoride. About one-fifth of the students were unaware about fluoride (Table 7).

Table 7: Percentage (95% CI) of respondents according to use toothpaste with or without fluoride (N=107).

Category	Yes	No	Don t know
Boy	75.76 (70.48-81.03)	3.03 (2.52-3.54)	21.21 (11.35-31.17)
Girl	73.17 (59.29-86.73)	2.44 (1.70-3.18)	24.39 (20.38-28.41)
Total	74.77 (66.54-82.99)	2.80 (2.50-3.11)	22.42 (14.53-30.33)

Discussion

Overall DMFT index of the students was 1.68 whereas the DMFT index of the boys was 2.08 and that of the girls was 1.02. The DMFT index was significantly higher in boys than that of girls.

Evidence had shown that strong knowledge of oral health demonstrates better oral care practice.[14] Tooth brushing practice is a good measure to take of oral health. In this study, we found that 57.76% of the students brushed their teeth twice or more a day which was very higher that the figure (44.4%) reported by WHO[15] but lower than the figure (95.7%) showed in a study in Sarwak, Malaysia.[16] Toothbrush and toothpaste were the most commonly used oral hygiene aids. In this study, we found that 92.24% of the students clean their teeth with toothpaste. They used not only the toothpaste but toothpaste with fluoride (75.76%) which is more appreciable. This is because of availability of toothbrushes and toothpastes in all area of Bangladesh. Besides this, increased health education and awareness make the students more careful about their teeth and oral cavity. Most of the students (91.38%) brushed their teeth before breakfast and more than half (59.48%) students did it after dinner. Only 11.21% students stated that they brushed their teeth after breakfast. Brushing of the teeth after dinner and after breakfast is the most important to keep the teeth and oral cavity healthy but most of the students brushed their teeth before breakfast. This may be due to ignorance. Now-a-days, adolescents are more conscious about their oral cavity, the appearance of their teeth and mouth odor. In this study, we found that most of the student's gingival condition is normal. This may be due to regular cleaning of teeth and oral cavity, and increase awareness within the students.

Conclusion

In conclusion it can be said that overall gingival condition of the students was good. Most of the students brushed their teeth twice a day. Most of the students used toothpaste to brush their teeth and they used fluoride containing toothpaste. Mean DMFT of the students considered low.

Study Limitation

The survey was conducted in only two urban secondary schools and among students aged 15 years. In Bangladesh, many urban adolescents do not go to school. As the survey represents only school going youth, it does not report the true picture of tooth brushing practice in the urban community as a whole. The sample size of 116 is not sufficient for all kinds of sub-group analysis and statistical tests.

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A Survey on Prevalance of Common Dental Problems among Patients Attending Dentistry OPD at Cox's Bazar medical college hospital

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Abstract

Background: *Oral health of the populations is increasingly becoming important both in developed as well as developing countries. With rapid changes in the lifestyle related behaviors including diet it is important to study the occurrence of common dental problems presented to the dental OPD.* ***Objective:*** *The objectives of this study were to identify the common dental problem for assessing the level of knowledge regarding dental care practices among the respondents.* ***Materials and methods:*** *This descriptive cross sectional hospital based survey was carried out to know prevalance of various dental diseases in patients who visited department of Dentistry at Cox's Bazar medical college hospital. They were examined and history as well as clinical findings. Recorded data was entered and analyzed in Microsoft excel.* ***Results and conclusions:*** *The patients ranged from 4 to 80 years in age with equal numbers from both genders. It was found that prevalance of Dental caries and a periodontal disease was highest amongst all dental diseases. It was also noted that more patients delayed seeking treatment till caries involved pulp. Requirement of preventive care is stressed.*

Key Words: Common Dental Problems, OPD at Cox's Bazaar, Bangladesh.

J Cont Dent Sci 2018;6(2):14-17

Introduction

The achievements in the field of oral healthcare in the world are many, yet oral health remains one of the major health problems both in developed as well as developing countries. The impact of the oral health problems is not limited to only pain and suffering but goes to extend of impairment of the function and affection on the quality of life of people affected. Also there is association of the some dental health problems with systemic diseases like non-communicable diseases which are increasing globally including in Bangladesh. These dental problems also share importance of oral health WHO celebrated world health day in the year 1995 with the theme 'Oral Health for Healthy life'.

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The oral health has not gained much attention of public health policy makers and it still remains a neglected area in public health policy. The rapid change in the eating behavior which has come with globalization and free market economy perpetuated with continued and increasing use of tobacco and related products has large adverse effects on the oral health of populations. To add to this the lack of resources in developing county like Bangladesh there is a larger need to focus on the oral healthcare of the Bangladeshi population.

This paper focuses specifically on the distribution of Common dental problems among the patients presenting to this dental OPD.

Materials and Methods

Study design: The design for the current study was a descriptive cross-sectional hospital based survey.

Study participants: The new patients attending dentistry OPD were requested to participate in the study and reply to the questions mentioned in survey sheet. Old patients were excluded to avoid duplication.

Study period: The study participants were recruited over a period of 1 month during mid-January to mid February.

Sample size: It was estimated to recruit 250 patients in the study looking at the patient load in the OPD of the hospital. Thus, the intended sample size was 250 patients.

Data collection method: It was a questionnaire based survey which was in two parts: Part 1: demographic details of the study participants. This was obtained primarily from their hospital case records and verified by interview of the patients. Part 2: Clinical information. This was filled at the end of consultation and treatment process for each patient. To ensure quality these participant questionnaires were filled by the treating dental surgeons themselves.

Study variables: Apart from the primary variables to understand the demographic profile of the study participants the main variables under study were: 1. the presenting dental problem 2. Systemic co-morbid conditions (if any) 3. Treatment modalities offered to these patients.

Data management and Statistical analysis: The data thus collected were entered and analyzed in Microsoft Office Excel. The study reports proportions of the variables under study in percentages. This being a descriptive study no statistical significance tests were applied.

Ethical issues: The study protocol was cleared through the local Institutional Ethic Committee of the institute. Informed consent was taken from the participants. The participants were informed that their participation in the study will be anonymous, voluntary and not compulsory. They were assured about anonymity and confidentiality of the information provided. This study being a descriptive study there was no intervention involved. Hence, there was less than minimal risk to the participants. Benefit to participants are indirect, as the results of the study may help in planning for providing better dental treatment to society in future.

Results

At the end of data collection, the study obtained information from a total of 258 participants from the dental OPD. Following is the narrative of the study results.

Table 1: Demographic profile of study participants (n=258)

Study variable	Number (%)
Gender	
Male	129 (50)
Female	129 (50)
Age (years)	
1-10	12 (4.6)
11-20	22 (8.5)
21-30	5119.7)
31-40	61 (23.6)
41-50	43 (16.6)
51-60	39 (15.1)
61-70	17 (6.5)
71-80	12 (4.6)

Table 1: shows the distribution of male and female patients in the dental OPD. It shows equal number of male and female patients who visited the dental OPD for their various dental problems. Majority of patients were of young age group with 30-40 age with 23.6% followed by 21-30 age group 19.7%, 41-50 age group with 16.6% and 51-60 age group 15.1%.

Table 2: various dental conditions observed in study population (n=258)

Dental condition	Number(%)
Gingivitis	32 (12.4)
Periodontitis	54 (20.9)
Dental Caries without pulpal involvement	28 (10.8)
Dental Caries with pulpal involvement	116 (44.9)
Dentinal Sensitivity	22 (8.5)
Impacted lower third molar	7 (2.7)
Impacted upper third molar	3 (1.1)
Oral Sub mucous Fibrosis	3 (1.1)
Trigeminal Neuralgia	1 (0.3)
Malocclusion causing facial disfigurement	6 (2.3)
Any other	30 (11.6)

Table 2: shows the distribution of various dental problems seen in dental OPD. As is evident from the table dental caries comes out as the most common dental problem constituting almost 56% of the total patients studied. It is important to note here that majority of these patients were having severe form of the caries with pulpal involvement. Second common condition was Periodontitis which was found in around one fifth of the study participants. Third important dental condition was gingivitis afflicting approximately 12% of the study participants. Dental sensitivity was the fourth major problem encountered in this study. Each of the other problems like impacted upper and lower third molars, trigeminal neuralgia, malocclusion and oral submucus fibrosis were seen with less than 10 % cases.

Our study proforma expected other two conditions also which was not presented by any patient during the data collection period. Fluorsis was one such condition. There were no impacted tooth reported apart from the upper and lower third molars.

Table 3: various treatment methods offered (n=258)

Treatment offered	Number (%)
Scaling	64 (24.8)
Periodontal surgery	17 (6.5)
Restoration	31 (12)
Endodontic Treatment	62 (24)
Extraction of tooth	97 (37.7)
Removal of impacted tooth	9 (3.4)
Other surgical treatment	6 (2.3)
Prosthodontic treatment	68 (26.3)
Orthodontic Treatment	6 (2.3)
Only medicines	23 (8.9)
Any other	4 (1.5)

Table 3: shows various dental treatment modalities that were offered to patients visiting dental OPD. It shows that extraction of teeth, scaling and endodontic treatment are the treatments which are given in majority of cases. Other treatments like periodontal surgeries, removal of impacted teeth, restoration, prosthodontics treatment, orthodontic treatment and other surgical procedures were also given. Extraction of teeth was done in cases of grossly carious teeth which cannot be saved by endodontic treatment and for root pieces were teeth cannot be saved and is a source of infection in oral cavity. Scaling was done for the problems such as gingivitis and localised periodontitis. Endodontic treatment was offered for problems like dental caries with pulpal involvement where teeth can be saved by root canal treatment. For periodontitis periodontal surgeries were done. For impacted molars disimpaction was 'done and _ for malocclusion orthodontic treatment was given. Prosthodontics treatment was given in those patients who required full crowns.

Discussion

While providing health care to society, it is important to have an idea about prevalence of various diseases, need of treatment, and perception of the diseases and treatments by public; and peoples' awareness for hygiene.

A survey helps us to know these things. A survey about various commonly occurring dental diseases and conditions, to know how frequently they are seen in new patients who attend Dentistry OPD at Cox's Bazar Medical College hospital.

Our study shows that there is equal predilection for male and female that visited the dental OPD for various dental problems. Study conducted by Ami M Maru, Sena Narendran, did not observe any significant gender differences in either caries prevalence or severity, and thus confirmed the findings by Shah.[4]

Oral health is an important component of general health, with dental caries affecting a person's ability to eat, speak or socialize. Our study shows that majority of patients were of young age group and major problem encountered was dental caries which is similar to the results shown by WHO prevalence of dental caries in the age-group of 35-44 years in the present study was found to be 82.4%, which is lower than that reported in the WHO Oral Health Country Profile (94%). However, the results were found to be higher than that found in a study conducted by Doifode et al

in Nagpur (48.6%) in the same age-group and by Chakraborty et al. in Siliguri (57.03%) in the age-group of 35-40 years.[5] Many studies have shown that the prevalence of periodontal diseases is high in their studies which is similar to our result that shows the prevalence of periodontal problems is high compared to other problems.[6] Dentinal hypersensitivity is challenging condition for patients to explain and for dentists to precisely diagnose.[7] Our study shows that after dental caries and periodontal problems dentinal hypersensitivity was third major problem seen. A study by Jagjit Singh Dhaliwal et al has found that the total prevalence of dentine hypersensitivity was 48.9% in the questionnaire group and 25% in the oral testing group [8] which does not correlate with our study. Many surveys have been carried out by different investigators about incidence of dental diseases. But it was seen that most of them did a survey in institutionalized groups of subjects e.g. school children, juvenile homes, orphanages, old age homes and so on. This study encompassed subjects from all ages.

Also it was seen that most of the surveys considered only a particular disease or condition, e.g. Dental caries, periodontal diseases etc. This study took into account most of the common dental diseases and conditions.

One of the limitations of our study is that this being a hospital based study we cannot comment on the prevalence or incidence of the dental problems in the populations. However in absence of population based surveys the hospital based data is the best alternative to reflect the prevailing dental health problems in the community of the catchment area of the tertiary care hospital where this study was conducted.

The dental OPD where this study was conducted is primarily situated in an urban area. Yet the study investigators have observed that the OPD caters to an equal number of patients both from rural as well as urban area. Since we could not collect the data on residence of the study participants hence we cannot comment on difference between the occurrences of the various dental problems in urban versus rural area. Geographic location segregated data would have enabled us to comment on this important aspect.

Conclusion

Thus, it can be said that dental caries with or without pulpal involvement, periodontitis, gingivitis and dentinal hypersensitivity are major problems which are seen in dental OPD. These findings will give direction to the prevention efforts towards the common dental problems in the catchment population of the study hospital.

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Item Analysis of MCQ, Part of An assessment Tool Evaluation

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Abstract

Introduction: *MCQs are used mostly for comprehensive assessment at the end of academic sessions and provide feedback to the teachers on their educational actions.* ***Objective:*** *Keeping the importance of MCQ Item analysis measure the students' responses to individuals test items to assess the quality of these test items and to create a question bank for avoiding repetition in future.* ***Methods and Materials:*** *The study was conducted on 134 Third year MBBS Community Medicine students who appeared in first term examinations in October 2017. It comprised of 20 "Multiple true/false response" MCQs. Each item was analyzed for Difficulty Index and Discrimination Index. After evaluation of class test, marks obtained by the students were arranged in descending order and entered in SPSS 19.* ***Results:*** *Mean difficulty index (dfi) was 29.89±16.68 while mean Discrimination index was 1.37 ±4.16. Level of significance (2-tailed test) is significant in dfi (p=.000). But di was not-significant (p= >.05). Each question contains highest value (1) and lowest value (0). Of the total 20 items, the total mean score (±SD) of the students were 14.33/20.* ***Conclusion:*** *MCQ items that demonstrate good discrimination tend to be in the moderately easy to moderately difficult range. Also the items that are in the moderately difficult to very difficult range are more likely to show negative discrimination.*

Key Words: Multiple Choice Questions, MCQ, Difficulty Index (dfi), Discrimination Index (di)

J Cont Dent Sci 2018;6(2):18-21

Introduction

Multiple choice questions (MCQs) are frequently used to assess students in different educational streams for objectivity and wide reach of coverage in less time. MCQs are used mostly for comprehensive assessment at the end of academic sessions and provide feedback to the teachers on their educational actions.[1] These can be used for both formative and summative assessments. Framing of good MCQs is a time-consuming and a challenging process. It is said that appropriately constructed MCQs result in objective testing that can measure knowledge, comprehension, application, analysis, and evaluation.[2] In simple terms, it is a process of collecting, summarizing, and using information from students' responses to assess the quality of test items. It includes parameters such as Difficulty Index (dfi), Discrimination Index (di), and Distracter Efficiency (de).[3] Keeping the importance of MCQ Item analysis measure the students' responses to individuals test items to assess the quality of these test items and to create a question bank for avoiding repetition in the future.

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Methods and Materials

The study was conducted on 134 Third year MBBS Community Medicine students who appeared in first term examinations in October 2017. It comprised of 20 'Multiple true/false response' MCQs. The examination time was 20 minutes and marks allotted were 20. All MCQs had a single stem with five options or responses. Each correct response was awarded 0.2 marks and each incorrect response was awarded 0, range of score being 0-1. There was no negative marking and the passing mark was 60%. Each item was analyzed for Difficulty index and Discrimination index. After evaluation of the class test, the marks obtained by the students were arranged in descending order and entered in SPSS 19. The higher scoring students (27%) were considered as high achievers (H) and lower scoring students (27%) as low achievers (L). For computation purpose, marks obtained by middle one-third were discarded. Each item was analyzed for two parameters, the difficulty index and discrimination index.

Difficulty index

It is the percentage of students in high and low achievers group who answered the item correctly. The range was from 0% and 100%. It was calculated using the formula DIF = H + L x 100/N; where, H = number of students answering the item correctly in the high achieving group, L = number of students answering the item correctly in the low achieving group, and N = total number of students in the two groups (including non-responder). The difficulty index for the question as a whole is indicated for the mean score for that question.

Table 1. Interpretation of difficulty index:

Cutoff points	Interpretation	Action
>70%	Relatively easy	Revise/ discard
<30%	Indicates relatively difficult	Discard
30-70%	acceptable	Store

Discrimination index or d value:

DI is the ability of an item to differentiate between students of higher and lower abilities and ranges between 0 and 1. It was calculated using the formula DI = 2 x (H-L)/N where, the symbols H, L, and N represent the same values as mentioned above. Results of DI were interpreted as shown in Table 2.

Table 2: Interpretation of discrimination index

Cutoff point	Interpretation	Action
> 0.35	excellent	store
0.25to 0.34	good	store
0.2 to 0.24	acceptable	store
<0.2	very poor	requiremodification

Statistical analysis

All analyses were performed by using SPSS version 19.

Difficulty index is defined as the percentage of those candidates recording either a true or false response for a particular branch in a multiple true-false response MCQ who gave the correct response. The optimal range is 0 - 1%. A low index may mean that students are attempting the item but are getting it wrong and a too high index may mean that regardless of how poor or how good the questions are, the students are able to get it correct. In this study, the difficulty index was determined by the percentage of students high and low achievers group who answered the item fully correct (1), partially correct (0.2 - 0.8), and totally incorrect (0).

Discrimination index is a measure, of how the 'good' students are doing versus the 'poor' students on a particular question. Knowing this, we expect the value of the discrimination index to range between 1 to 0. Meaning that all 'good' students are correct versus no 'poor' students are correct by the former method or the maximum value for a positive correlation by the latter method.

Discrimination index of 0.35 and higher is considered as very good items, 0.25 - 0.34 is reasonably good, and 0.2 - 0.24 are marginal items (i.e. subject to improvement).

All data are reported as mean - SD of n items. The relationship between the item discrimination index and difficulty index values for the test paper was determined using one sample t-test. The P value of <0.05 was considered to indicate statistical significance.

Results and Discussion

The study was conducted on 134 Third year MBBS Community Medicine students, where the higher scoring students (27%) were considered as high achievers (H) and the lower scoring students (27%) as the low achievers (L). We calculated this from two groups of a total of 72 students. For computation purpose, marks obtained by middle one-third were discarded. Each item was analyzed for two parameters, the difficulty index and discrimination index.

Table 3: Mean of Difficulty index (Dfi) and Discrimination Index (Di)

One -Sample Statistics

	N	Mean	Std. Deviation	Sig. (2-tailed)	Std.Error Mean
dfi	20	29.89	16.68	.000	3.72990
di	20	1.37	4.16	.157	.93132

In Table 3 mean difficulty index (dfi) was 29.89±16.68 while mean Discrimination index was 1.37±4.16. The level of significance (2-tailed test) is significant in dfi (p=.000). But di is not significant (p= >.05). Each question contains the highest value (1) and lowest value (0). Of total 20 items, the mean score (±SD) of the students were 14.33/20. Difficult indices of 11 questions (55%) of the MCQ items were acceptable (p= 30 - 70%), only 9 (45%) of MCQs were difficult (p= <30%). There were no easy questions (p= >70%). The Discrimination indices of 11 (55%) MCQ (Question Numbers 1,2,3,7,10,11, 12, 13, 16 and 19) was >0.35, these were excellent. Only in 2 MCQ (Question number 17 and 9) the di was 0.25-0.34 (only 10%) these were good questions. The discrimination index of only one question 5% (question number 6) was 0.2-0.24. This was acceptable. There were 30% questions with poor di (for example Question number 4, 5, 8, 14, 15, and 20). There, the di was < 0.2. In Question number 4, the di was -0.06, this question was too difficult or poorly constructed.

The effective measurement of knowledge acquired is an important component of medical education. The MCQ form is an useful assessment tool in measuring factual recall and if carefully constructed can test higher order of thinking skills which is very important for a medical graduate. The method of assessment should be regularly evaluated. It is important to evaluate MCQ items to see how effective they are in assessing the knowledge of students.[4]

Review of the individual question is most important. If a test or a question paper contains substantial number of poorly constructed questions, it would be reflected in a review of test as a whole. On the other hand, when only a small number of questions are poorly constructed, the review of the test will not be useful. Hence, individual questions should also be reviewed.

The basic purpose of the methods is to give a numerical value to the relationship between scores for the total MCQ test and the score for a single item. Although there are various similar ways of calculating the discrimination index, here, the researcher used the simplified technique of selecting the upper and lower 27% student, which have been demonstrated by Kelly[5] to be the most efficient fraction.

It is important to understand that although very difficult or easy items will have low ability to discriminate, such items are often needed to adequately sample course content and objectives. Further, an item may show low discrimination if the test covers a wide range of content areas at different taxonomic levels of cognitive skills. This is very much a case with Community Medicine curriculum.[6]

It has to be remembered that the difficulty index not only reflects the attributes of a question, but also reflects the ability of the group responding to the question. Difficult indices of 11 (55%) MCQ items were acceptable (p=30-70%), only 9 (45%) of MCQs were difficult (p= <30%). There were no easy questions (p=>70%).

The reasons for poor discrimination index would include, these questions had too easy or too difficult or not pertaining to the syllabus. The Question numbers 4, 5, 8, 14, 15, and 20 had a di of < 0.2. The question number 4 had a di was -0.06. So this question is too difficult or poorly constructed. These questions need modification.

The findings of this study showed that substantial number of questions were difficult (question numbers 4,5,6,8,12,14,15 and 17). So in the future we need to select MCQ items deliberately, on which our students appeared to consistently better perform in this assessment methods compared to the SAQs and OSPEs methods.

This part of assessment tool is very important because its objectivity is very high due to absence of bias, its content validity is more and its reliability is high.

Based on the end-of-course self-evaluation by the students, time does not seem to be the major factor for the poorer performance in the MCQ test. The importance of evaluating assessment has been highlighted by Fowell and coworkers, who noted that when devising suitable assessment systems, this step of the assessment cycle is often omitted. And yet most medical educators involved in curriculum planning and development recognize the interplay between assessment and learning, and that to a large extent assessment drives learning.[7]

Conclusion

MCQ items that demonstrate good discrimination tend to be in the moderately easy to moderately difficult range. On the other hand, items that are in the moderately difficult to very difficult range are more likely to show negative discrimination. The wide scatter of discrimination needs further investigation, and before we discard an MCQ for poor discrimination, we must first look into the factor(s) that may contribute to such poor discrimination.

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Non-Alcoholic Fatty Liver disease in Type 2 Diabetes Mellitus

CS Bose[1], M Sarker[2]

Abstract

Background: *Non alcoholic fatty liver disease (NAFLD) has emerged as the most common cause of chronic liver disease worldwide. Type 2 Diabetes Mellitus (T2DM) is a risk factor for progressive liver disease and mortality in patients with NAFLD, whereas NAFLD is a marker of cardiovascular risk and mortality in patients with T2DM. Hence, the diagnosis and evaluation of fatty liver is an important part of management of diabetes.* ***Objective:*** *This study was conducted to determine anthropometric and metabolic parameters in diabetic patients with NAFLD. Anthropometric and metabolic parameters in diabetic patients with fatty liver were compared with diabetic patients without fatty liver.* ***Methods:*** *This case control study was conducted on 256 patients with type 2 diabetes mellitus attending Bangladesh Institute of Research and Rehabilitation in Diabetes, Endocrine and Metabolic Disorders (BIRDEM). A total of 127 diabetic patients with fatty liver were considered as cases and 129 diabetic patients without fatty liver considered as controls. History and thorough clinical examination including anthropometry waist hip ratio and body mass index (BMI) and lab investigations were done. Ultrasound abdomen was done to detect fatty liver. Anthropometric and metabolic parameters in diabetic patients with fatty liver were compared with diabetic patients without fatty liver.* ***Results:*** *In our study diabetic patients with fatty liver had high body mass index (BMI), elevated SGPT /SGOT ratio 1 when compared to diabetic patients without fatty liver. This was found to be statistically significant ($p<0.021$).* ***Conclusion:*** *BMI would act as early anthropometric indicators in prediction of NAFLD in type 2 diabetic patients. SGPT/SGOT ratio could act as biochemical marker for prediction of development of fatty liver in diabetic patients.*

Key Words: Non-alcoholic fatty liver disease (NAFLD), Type-2 Diabetes Mellitus, body mass index (BMI)

J Cont Dent Sci 2018;6(2): 22-24

Introduction

Non-alcoholic fatty liver disease has emerged as the most common cause of chronic liver disease worldwide.[1] It can lead to hepatocellular carcinoma and is an impendent determinant of cardiovasculardisease (CVD).[2] NAFLD is therefore a complex problem with implications far beyond the liver.

Type 2 DM increases the risk of liver-related death by up to 22-fold in patients with NAFLD.[3] In patients with Type 2 diabetes, the prevalence of NAFLD is as high as 75%.[4] Diabetes mellitus is frequently observed in patients with NAFLD, being present in 18-45% of cases.[5,6] Type 2 DM is a risk factor for progressive liver disease and mortality in patients with NAFLD. Whereas NAFLD is a marker of cardiovascular risk and mortality in patients with diabetes. Hence, the diagnosis and evaluation of fatty liver is an important part of management of diabetes.

We conducted a study to determine the anthropometric and metabolic parameters in NAFLD patients with type 2 diabetes.

Anthropometric and metabolic parameters in diabetic with fatty liver were compared with diabetic patients without fatty liver.

Materials and Methods

This observational case-control study was conducted at BIRDEM from January 2016 to June 2016.

The study subjects were 256 patients with type 2 diabetes mellitus. Of them, 127 are diabetic patients who had fatty liver and 129 are diabetic patients without fatty liver. Written informed consent was taken from all the study subjects. Patients consuming alcohol, patients with congestive cardiac failure and renal failure, patients on hepato-toxic drugs, patients with history of extensive small bowel resection and patients on insulin are excluded from the study.

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Anthropometry (waist hip ratio and BMI) were done to 256 patients.

HbAlc (%), Uric acid (mg%), serum SGPT, serum SGOT were done for all patients.

USG of abdomen was done to detect fatty liver. Anthropometric and biochemical parameters in diabetic patients with fatty liver were compared with diabetic patients without fatty liver.

Statistical Methods

Statistical analysis was done by comparing diabetic patients with fatty liver and diabetic patients without fatty liver. Unpaired student's T test was done and $p<0.05$ was considered to be significant.

Results

A total of 256 patients participated in the study. Data of 127 diabetic patients with fatty liver was compared with 129 diabetic patients without fatty liver.

Demographic profile: Mean age of T2DM with fatty liver and T2DM without fatty liver was 43.33-6.36 years and 42.89-5.85 years respectively. The value did not show any statistically significant difference (p=0.559). There were 15 males and 112 females in the group of T2DM with fatty liver; and 31 males and 98 were females in T2DM without fatty liver respectively.

Table 1: Comparison of anthropometric variables in diabetic patients with and without fatty liver

Anthropometric Variables	Diabetic patients with fatty liver (Cases) (Mean-SD)	Diabetic patients without fatty liver . (Controls.) (Mean - SD)	'p' value
Weight(kg)	68.9-11.11	66.92-7.85	0.511
Height (cm)	160.26- 13.54	167.85- 9.55	0.037
Waist Hip ratio	0.923-.060	0.918- .074	0.589
BMI(kg/m^2)	26.19- 3.69	25.32- 3.47	0.053

In Diabetic patients with fatty liver Mean BMI was 26.19 - 3.69(kg/m2); mean waist hip ratio was 0.93 - 0.162. Waist hip ratio was normal in 60% of the cases.

In Diabetic patients without fatty liver mean BMI was 25.32- 3.47(kg/m2); mean waist hip ratio was 0.918 - 0.074. hip ratio was normal in all controls.

Comparison of Biochemical Parameters:

Diabetic patients with fatty liver SGPT/SGOT ratio was >1 in 60% of the cases.

Diabetic patients without fatty liver SGPT/SGOT ratio>l was seen in only 20% of controls.

Table 2: Comparison of biochemical variables in diabetic patients with and without fatty liver.

Biochemical parameters	Diabetic patients with fatty liver (Mean -SD)	Diabetic patients without fatty liver (Mean -SD)	'p' value
SGPT/SGOT ratio > 1	1.01- 289	0.835-0.148	0.021
Uric acid (mg%)	6.39-1.181	3.7-1	0.001
HbAlc (%)	9.46-4.66	7.6- 0.76	0.211

Table 2 shows that Mean SGPT/SGOT ratio among Diabetic patients with fatty liver was 1.01-.289 and in Diabetic patients without fatty liver 0.835-0.148. Mean of uric acid, level was 6.39-1.181 mg% in Diabetic patients with fatty liver and in Diabetic patients without fatty liver 3.7-1 mg%; Mean HbAlc (%) was 9.46-4.66% among Diabetic patients with fatty liver and 7.6-0.76% in Diabetic patients without fatty liver. Statistically significant difference was found among the means of SGPT/SGOT ratio and Uric acid (mg%) of the Diabetic patients with fatty liver and Diabetic patients without fatty liver (p= 0.021 and p=0.001 respectively).

Discussion

In our study, we found that anthropometric parameters like BMI and SGPT/SGOT ratio > 1 are risk to develop NAFLD. In our study, SGPT/SGOT ratio > 1 was associated with increased incidence of fatty liver thereby implying its role as a screening test in detection of fatty liver.

Obesity and in particular central obesity has been described as one of the strongest risk factors for NAFLD and fibrosis, with NASH (Non Alcoholic Steatohepatitis) being prevalent in 18.5% of the obese patients.[7,8] Goland et al showed that patients with NAFLD had a significantly higher BMI.[9] In our study BMI was high in diabetic patient with NAFLD thereby implying role of abdominal obesity and hence BMI in pathogenesis of fatty liver in diabetic patients and need of weight control in these patients.

NAFLD is commonly characterized by elevated levels of markers of liver injury like SGPT and SGOT. Of these liver enzymes, SGPT is most closely related to liver fat accumulation, and is often used in epidemiological studies as a surrogate marker for NAFLD.[10] It is now clearly known that the whole spectrum of histological findings of fatty liver and NASH may exist without elevation of transaminases.[11] In our study 60% of diabetic patients with fatty liver had SGPT/SGOT ratio was>1. The ratio of SGPT/SGOT is usually less than 1 in patients who have either no or minimal fibrosis, although this ratio may be greater than 1 with the development of cirrhosis.[12]

We found that there was no statistical correlation of HBAlc with NAFLD, reason for this observation could be due to the smaller sample size.

In our study of NAFLD, according to Williamson et al independent predictors of NAFLD in diabetic patients are BMI, HbAlc.[13]

Our study had some limitations. The important limitation of this study is that subjects did not have a liver biopsy and histological examination, which is the gold standard technique for identifying the status.

Conclusion:

Increased BMI would act as early anthropometric indicators in prediction of NAFLD and SGPT/SGOT ratio > 1 is a risk to develop NAFLD in type 2 diabetic patients.

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Review Article

An Overview on Protocol For Periodontal Therapy

JU Mahmood [1]

Abstract

Gingival and Periodontal diseases involve gum and supporting structure of teeth and oral mucosa. Poor oral hygiene leading to pain and inflammation of periodontium, and eventual loosening of teeth has profound effect on systemic and overall health. Advance periodontitis is a leading cause of tooth loss which effect function and esthetics. A review on available protocol on periodontal therapy was carried out through this paper.

Key words: Gingivitis, Periodontitis, Oral hygiene

J Cont Dent Sci 2018;6(2): 25-29

Introduction

Periodontics deals with oral health care, prevention, diagnosis and treatment of diseases of the supporting and surrounding tissues of teeth and dental implants. Periodontal diseases involve the diseases of gum and supporting structures of teeth and oral mucosa. Periodontic-endodontic lesions management and tooth replacement by placing dental implants are close components of comprehensive periodontal therapy. Periodontal diseases associated linked to systemic disease e,g, cardiovascular , respiratory, renal failure, diabetes and inflammation in the body .[1,2] Laser with particular wavelength has role in periodontal therapy.

Research on mechanism of periodontal disease initiation, progression and pathogenesis have helped do draw protocols for definite and effective periodontal therapy.[3-8] With proper professional treatment, effective plaque control and continuing oral hygiene care, the patients can retain their dentition throughout their life effectively.[9-12] Nevertheless, in some advanced periodontal disease tooth loss is inevitable.

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The purpose of periodontal therapy is to preserve healthy natural dentition, periodontium and peri implant tissues; hence provide comfort, esthetic and function. Healthy periodontium means absence of inflammatory signs of disease such as redness, swelling, suppuration and bleeding on probing, maintenance of functional periodontal attachment level, minimal or no recession in the absence of interproximal bone loss and functional dental implant.

Gingival and Periodontal Disease

Gingivitis is inflammation of gingiva without loss of epithelial attachment.[13-14] Gingivitis may be categorized as acute and chronic, mild, moderate and severe depending on severity. Also plaque and non plaque induce gingivitis.

Periodontitis is inflammation of periodontium with progressing loss of epithelial attachment.[14,15] Different forms of periodontitis observed such as acute and chronic periodontitis, chronic aggressive periodontitis, necrotizing ulcerative periodontitis. Periodontitis as manifestation of systemic disease and periodontitis associated with endodontic lesions. Depending on severity of attachment and bone loss , periodontitis may be mild, moderate and severe; by extend as localized or generalized and according to treatment status as recurrent or refractory. [16,17]

Article Received: 18.12.2017; Article Accepted: 25.04.2018

Gingival recession involves loss of periodontal attachment and affects children and adults. Incidence of periodontitis increases with age.[18] Analogous results were found in Periodontic outpatient department (OPD) of Dhaka dental college. Thinning and flat edentulous ridge defects results from loss of alveolar bone and affects esthetics or complicate denture retention and failure of implant placement.

Periodontal examination, diagnosis and assessment of prognosis

Periodontal examination includes proper history taking, medical and dental history, Systemic and local examination, and radiological analysis. In some cases biochemical, microbiologic and other diagnostic test may be necessary in an individual for evaluating the periodontal status of the person.

1. Extra oral and intra oral examination to detect non-periodontal and periodontal disease or conditions extended to extra oral area.
2. General gingival examination to evaluate the color, texture, shape of the gingiva and related structures.
3. To check probing depth, recession, attachment level, to measure the health of sub-gingival area such as bleeding on probing and suppuration, to evaluate clinical furcation condition and to detect periodontal-endodontic lesions.
4. Assessment of the presence, degree of distribution of plaque, calculus and gingival inflammation.
5. Dental examination comprises caries detection, gingival/periodontal status, proximal contact with adjacent teeth, condition of dental restorations, and prosthetic appliances, and implant status if any.
6. Cheek the mobility of teeth and implant if any.
7. Occlusion examination.
8. Analysis of intra oral, periapical, bite wing and OPG X- ray and other imaging
9. Selection of suitability to receive dental Implants.
10. Evaluation of periodontal and systemic diseases interrelationships.

All this information should be recorded in the patient's file and communicated to the patient, and /or referred whenever necessary.

Treatment Plan

The clinical findings together with a diagnosis and expected prognosis should be used to develop a logical treatment plan. One type treatment may be appropriate for one section of the mouth, while another approach may be suitable at other sites.

Treatment Procedure/s

A wide range of treatment exists in gingival and periodontal diseases. These include:

1. Patients education, training in personal oral hygiene andtooth brushing technique.Use of floss and mouth rinsing
2. Removal of supra gingival and accessible sub gingival bacterial plaque and calculus is completed by periodontal scaling.
3. Root planing: Comprehensive periodontal root planing is used to treat root surface irregularities to gain attachment of supporting tissues to tooth.
4. Finishing procedures, which includes post treatment evaluation with review and oral hygiene instruction. This step is very important to bring success to treatment.
5. Periodontal surgical procedure to be performed where necessary. Especially inaccessible area for instance deep periodontal pocket.
6. Counseling of risk factors (e,g, smoking, medical status ad stress)
7. Consideration of adjunct restorative, prosthetic, orthodontic and or endodontic consultation of treatment.
8. Provision of reevaluation during and after periodontal or dental implant therapy.

9. When necessary diagnostic testing that may include radiological, microbiological, or biochemical assessment or monitoring during the course of periodontal therapy.
10. Follow up for oral hygiene maintenance or periodontal maintenance program at 3 months interval.
11. In diabetic patient blood sugar monitoring control before and after treatment is important.
12. In blood disorder, proper investigation and precaution is necessary before initiation of treatment. In history of excessive bleeding, thromboplastin regeneration time to be done to determine the factor viii deficiency and it helps to distinguishes from factor IX deficiency.
13. In infective patients, like hepatitis B, tuberculosis, strict sterilization and different sets of instruments should use, preferable disposable instruments should use.

The following treatment may be indicated in addition to the above out line procedures:

1. Chemotherapeutic agents: These agents may be used to reduce inflammation, eliminate or change the quality of microbial pathogens or change the host response through local or systemic delivary of appropriate agents.
2. Periodontal surgery: This include gingivectomy, gingivoplasty, vestibuloplasty to increase width of attached gingival, various types of muco-gingival flap procedures, apical curettage and soft tissue augmentation. Osseous processes include ostectomy and bone grafting. Dental procedures include root resection, tooth hemi-section and odontoplasty. Combined osseous and dental tissue procedures may be required for management of endodontic-periodontal lesions.
3. Periodontal regenerative procedures include: soft tissue graft, bone grafts , root bio-modification, guided tissue regeneration and combination of these procedures for treating osseous , furcation and recession defects. Periodontal regenerative procedures include: guided bone regeneration, ridge augmentation, ridge preservation and Implant site development and sinus grafting.
4. Periodontal plastic surgery for gingival augmentation, for correction of recession or soft tissue defects and for other enhancement of oral and dental esthetics.
5. Occlusion therapy include: Minor tooth movement, occlusion adjustment, splinting or provision of devices to reduce occlusal trauma.
6. Pre prosthetic periodontal procedure include: Exploratory flap surgery, resective procedures, regenerative or reconstructive procedures, crown lengthening surgery performed to facilitate restorative or prosthetic treatment plans.
7. Selective extraction of teeth, roots in order to facilitate periodontal therapy. In some cases severe periodontitis, extraction of tooth/teeth, bio-modification and then splinting with fiber optic strip and composite material. So as to retain original tooth is possible. Implant site development or Implant, restorative and or prosthetic treatment plans.
8. Replacement of teeth by dental Implants.
9. Procedures to facilitate orthodontic treatment including: monocortical osteotomy to facilitate faster tooth movement, tooth exposure, frenulectomy, fiberotomy, gingival augmentation and Implant placement.

Periodontal Maintenance therapy

After active periodontal treatment, follow up periodontal maintenance visits should include:

A)

1. Assessment of oral hygiene status with reinstruction when necessary.
2. Evaluation of current extra and intra oral, periodontal and peri- implant soft tissues as well as dental hard tissues.

3. Emphasis to correct way of regular tooth brushing to remove dental plaque, biofilm, stain and calculus. Local delivery or systemic chemotherapeutic agents may be used as an adjunctive treatment for recurrent refractory disease.
4. Update of medical and dental histories.
5. Identification and treatment of new, recurrent or refractory areas of periodontal pathosis.
6. Ramfjord et al (1982), the authors of 18 years study of patients recalled every 3 months , conclude that plaque control self care by the patient during healing phase is extremly important for the preservation and reduction of periodontal pocket and also clinical attachment gain.[19]

B)

The patients should be informed of:

1. Areas of persistence, recurrent, refractory or new periodontal disease.
2. Changes in the periodontal prognosis.
3. Advisability of further periodontal treatment or retreatment of indicated sites.
4. Status of dental implants
5. Other oral health problems noted that may include caries, defective filling and non periodontal mucosal diseases or condition.

Informed consent and Patient Records

When there is chance of risk, potential complications, or the possibility of failure are associated with treatment, informed consent should be taken before commencement of therapy and should be maintained.

The information given to the patient should include the following:

1. The diagnosis, etiology, proposed therapy and possible alternative treatment(s). The prognosis with or without proposed therapy.
2. Recommendations for referral to other health care providers when necessary
3. The reasonably inherent risks and potential complications associated with the proposed therapy, including failure with the ultimate loss of teeth or dental implants
4. The need for periodontal maintenance treatment after active therapy due to the potential disease recurrence.
5. A long term periodontal maintenance program has recommended for the patient to keep disease free oral health and maintenance of dental implant if present.

Preservation of complete records of diagnosis, treatment, results and recommended follow up are essential, starting with initial examination and continuing for as long as the patient is under care. In some cases for instances systemic diseases such as cardiovascular diseases, uncontrolled diabetes, hepatitis, tuberculosis if proper precaution not taken may adversely affect systemic health that is beyond control of dentist [20-22] and may need to modify periodontal treatment to oral hygiene phase therapy. In some patients limited periodontal therapy done who are medically compromised. [23] Gingival diseases of genetic origin may involve the tissue of the periodontium. Hereditary gingival fibromatosis is one of the most clinically evident conditions-which exhibits autosomal dominant or (rarely) autosomal recessive mode of inheritance.[24]The gingival enlargement may completely cover the teeth.

Management by Surgical Intervention

In short Treatment Strategy:

1. Oral hygiene instruction(OHI)-tooth brushing and flossing
2. Scaling and polishing.
3. In some case root planning
4. In case periodontal pocket depth less than 5mm, modified Widman's technique may be used.

5. Periodontal pocket depth more than 5mm or more periodontal flap surgery.
6. Root bio modification and antiseptic irrigation has very good impact on healthy periodontium.
7. If oral hygiene improves and if needed, gingival augmentation, vestibuloplasty, soft and hard tissue graft can be done.

Conclusion

In conclusion, according to patients overall health condition, dentist will decide by his knowledge and experience which and what extend of treatment should provide maximum benefit.

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