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Oxidative Stress in Diabetes Mellitus

Akter M

Diabetes mellitus is a metabolic disorder characterized by chronic hyperglycemia with disturbances of carbohydrate, fat and protein metabolism resulting from defects in insulin secretion, insulin action or both.¹

According to World Health Organization, the etiological classification of DM are: type 1 diabetes (due to β -cell destruction leading to absolute insulin deficiency), type 2 diabetes (due to insulin resistance and relative insulin deficiency), gestational diabetes mellitus (DM during gestation), other specific types of diabetes due to other causes, e.g. genetic defects in β -cell function, genetic defects in insulin action, diseases of the exocrine pancreas (pancreatitis), endocrinopathies (acromegaly), pancreatic dysfunction caused by drugs, chemicals or infections. Among them, type 2 diabetes is more common and about 90 to 95% of all cases of DM.²

Oxidative stress results from an imbalance between antioxidants and pro-oxidants due to different factors such as aging, drug actions and toxicity, inflammation and/or addiction.³ It is in general, excess formation or/and insufficient removal of highly reactive molecules such as reactive nitrogen species (RNS) and reactive oxygen species (ROS).⁴

ROS level elevation in diabetes may be due to decrease in destruction by catalase (CAT—enzymatic/non-enzymatic), superoxide dismutase (SOD) and glutathione peroxidase (GSH-Px) antioxidants. The variation in the levels of these enzymes makes the tissues susceptible to oxidative stress leading to the development of diabetic complications.⁵

In addition, chronic hyperglycemia in type 2 DM causes increased generation of free radicals from glucose autooxidation and glycoxidation. These excess free radicals cause lipid peroxidation leading to oxidative stress that causes diabetic complications such as diabetic nephropathy, retinopathy, neuropathy and cardiovascular disease. . Malondialdehyde (MDA), the end product of lipid peroxidation, is a good marker of free radical-mediated damage and oxidative stress in type 2 diabetes mellitus.^{6,7}

Diabetic hyperglycemia, by the process of free radical production, causes protein glycation and oxidative degeneration. The degree of such protein glycation is

estimated by using some biomarkers such as glycated hemoglobin and fructosamine levels. Alteration in function and structure of antioxidant protein enzymes also due to nonenzymatic glycation. So detoxification of free radicals is effected enhancing oxidative stress in diabetes.⁸

It is believed that in the onset and progression of late diabetic complication, free radicals have major role due to their ability to damage lipids, proteins and DNA.⁹ Many studies show link between diabetes and oxidative stress by measuring various biomarkers. A variety of pathological conditions are induced by oxidative stress such as Rheumatoid arthritis, diabetes mellitus and cancer.¹⁰ Free radical and oxidative stress induced complications from DM include coronary artery disease, Neuropathy, nephropathy, retinopathy.¹¹ In-vivo studies support the role of oxidative stress induced by hyperglycemia in the generation of endothelial dysfunction in blood vessels of diabetic patients.¹² Hyperglycemia cause oxidative stress leading to atherosclerosis in diabetic patient.¹³

Oxidative stress has been demonstrated in many studies to participate in the progression of diabetes and elevation of the complication incidence. Thus, oxidative stress seems to be more worrying in metabolic disorders in diabetic patient. Now it is time for handling the oxidative stress effectively with importance on both prevention of free radicals production and removal them by antioxidants in clinical practice for better management of diabetes mellitus.

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Comparison of Serum Chromium Levels with Glycaemic Control and Disease Duration in Type 2 Diabetes Mellitus Patients

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Abstract

Background: Lower serum chromium levels in type 2 diabetes mellitus patients and its association with poor glycaemic control has been well recognized. **Objective:** To observe serum chromium levels between well controlled and uncontrolled groups and disease duration in type 2 diabetes mellitus patients. **Methods:** The cross-sectional study was conducted among 50 subjects with type 2 diabetic mellitus patients with age ranging from 40 to 55 years in the Department of Physiology at Dhaka Medical College in Dhaka, Bangladesh done from July 2014 to June 2015. Among them, 25 patients were considered as well as control group and 25 patients were considered as uncontrolled group for comparison. The patients with type 2 diabetes mellitus were selected from the Bangladesh Institute of Research for Diabetes Endocrine and Metabolic Disorders (BIRDEM) General Hospital in Dhaka on the basis of inclusion and exclusion criteria. The study parameter serum chromium (Cr) level was measured by using flame atomic absorption of spectrophotometer in spectrophotometric method estimated in the laboratory of the Department of Soil, Water and Environment at University of Dhaka at Dhaka. These correlations were analyzed by Pearson's correlation coefficient test. Patients with duration of type 2 diabetes mellitus were sub-divided into two groups: Group B₁ (diabetes mellitus for 1 to 5 years) and Group B₂ (diabetes mellitus for 6 to 10 years). For statistical analysis, unpaired Student's 't' test and Pearson's correlation coefficient test were applied. **Results:** This study showed that mean serum chromium level (0.10 ± 0.85 $\mu\text{g/L}$ vs 0.13 ± 0.05 $\mu\text{g/L}$) was significantly lower in the uncontrolled group in patients with type 2 diabetes mellitus. Serum chromium level showed negative correlation ($r = -0.168$) with group B₁ which showed statistically no significant association and also showed positive correlation ($r = +0.271$) with group B₂ which showed statistically no significant association. **Conclusion:** These findings show that serum Cr levels were lower in uncontrolled diabetes mellitus patients. Lower serum chromium level seems to be affected at the same glycemic status in duration of type 2 diabetes mellitus.

Key words: Serum chromium, type 2 diabetes mellitus patients.

Introduction

Diabetes mellitus (DM) is a prevalent endocrine disorder characterized by hyperglycemia, often resulting in complications like coronary artery disease, peripheral arterial disease, stroke, retinopathy, nephropathy, and neuropathy. Among potential interventions, chromium

have the potential to improve glycemic management.^{1,2,3} Diagnostic criteria of diabetes mellitus are fasting blood glucose level of ≥ 7.0 mmol/L, after 2 hour value of ≥ 11.1 mmol/L in 75 g oral glucose tolerance test and HbA_{1c} of ≥ 6.5 .⁴ Diabetes and its complications are the leading causes of early death in most nations, according to IDF

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(2013). In 2013, diabetes caused about 5.1 million deaths and in every six seconds a person dies from diabetes.⁵ Many studies have reported the link between glycaemic status and chromium. They observed diabetes and poor glycaemic control alters the metabolism of Cr.^{6,7} Chromium is an essential trace element. The predominant chromium form in the body is trivalent chromium (Cr^{3+}). Low molecular weight chromium (LMWCr) also known as chromodulin, is through to bind Cr^{3+} and enhances the response of insulin receptors. The inactive insulin receptors on cell membranes are converted to an active form by binding with circulating insulin. This binding stimulates the movement into cells of chromium bound to plasma transferring. Chromium then binds to apoLMWCr then converting it to an active form and then binds to the insulin receptors resulting in improved insulin sensitivity, glucose utilization, and beta cell sensitivity.^{8,9,10} Diabetics have lower serum chromium levels than non-diabetics, according to many studies.^{6,7} In diabetics, a lack of chromium promotes oxidative stress, which can lead to atherosclerosis.¹¹ This study aimed to investigate serum chromium level in type 2 diabetes mellitus and its change with duration of disease.

Material & Methods

A cross-sectional study was done from July 2014 to June 2015 at the Department of Physiology at Dhaka Medical College in Dhaka. The protocol for this study was approved by the institutional Ethical Review Committees of Dhaka Medical College and the Bangladesh Diabetic Association. Fifty subjects with type 2 diabetes mellitus patients with age ranging from 40 to 55 years. Among them, 25 patients were considered as well as control group and 25 patients were considered as uncontrolled group for comparison. The patients with type 2 diabetes mellitus were selected from the Bangladesh Institute of Research for Diabetes Endocrine and Metabolic Disorders (BIRDEM) General Hospital in Dhaka on the basis of inclusion and exclusion criteria. After the subjects were chosen, the nature, goal, and benefit of the study were explained in detail to each subject, and informed written consent was obtained. Before drawing blood, a thorough medical and family history was collected. The individuals anthropometric measurements and blood pressure were taken. A data was used to keep track of everything. A disposable plastic syringe was used to collect 5 mL of venous blood from each subject's antecubital vein for estimate of biochemical assays. HbA_{1c} , FPG levels were estimated in the laboratory of the Department of Biochemistry, BIRDEM General Hospital, Dhaka. The study parameter serum chromium (Cr) level

was measured by using flame atomic absorption of spectrophotometer in spectrophotometric method estimated in the laboratory of the Department of Soil, Water and Environment at University of Dhaka at Dhaka. These correlations were analyzed by Pearson's correlation coefficient test. Patients with duration of type 2 diabetes mellitus were sub-divided into two groups: Group B₁ (diabetes mellitus for 1 to 5 years) and Group B₂ (diabetes mellitus for 6 to 10 years). For statistical analysis, unpaired Student's 't' test, Chi square test and Pearson's correlation coefficient test were applied. P value < 0.05 was accepted as level of significance. Statistical analyses were performed by using a computer based statistical program SPSS Version 20.

Results

The present study had 14 males (56%) and 11 females (44%) with mean age of 47.98 ± 3.98 years in controlled and 15 males (56%) and 10 females (44%) with mean age of 48.00 ± 3.90 years in uncontrolled diabetes patients group. Systolic and diastolic blood pressures were normal limits in both groups, average BMI revealed "overweight" in uncontrolled group (Table I). The mean serum chromium level was 0.13 ± 0.05 $\mu\text{g/L}$ in the controlled and 0.10 ± 0.05 $\mu\text{g/L}$ in uncontrolled diabetes patients group (Table II). Serum chromium level showed negative correlation ($r = -0.168$) with group B₁ which showed statistically no significant association and also showed positive correlation ($r = +0.271$) with group B₂ which showed statistically no significant association (Table III & Figure 1).

Table I: General characteristics and serum chromium levels of the subjects in both groups (n=50)

Parameters	Controlled Diabetes Patients (n=25)	Uncontrolled Diabetes Patients (n=25)
Age (years)	47.98 ± 3.98	48.00 ± 3.90
Sex		
Male	14 (56%)	15 (60%)
Female	11 (44%)	10 (40%)
Body mass index (kg/m^2)	25.96 ± 2.67	26.80 ± 3.03
Systolic blood pressure (mmHg)	122.37 ± 6.31	123.40 ± 7.05
Diastolic blood pressure (mmHg)	77.30 ± 5.70	79.70 ± 5.19

Sex distribution has been shown in number and percentage. All other results are expressed as mean $\pm$ SD. Unpaired Student's 't' test was performed to compare between groups. n = Number of subjects.

Table II: Study parameters of the subjects in both groups (n=50)

Parameters	Controlled Diabetes Patients (n=25)	Uncontrolled Diabetes Patients (n=25)
Fasting serum glucose (mmol/L)	8.05±0.60	12.06±1.28
HbA _{1c} (%)	7.05±0.49	11.8±1.60
Serum chromium (ig/L)	0.13± 0.05	0.10±0.85

Results are expressed as mean±SD. Unpaired Student's 't' test was performed to compare between groups. n = Number of subjects.

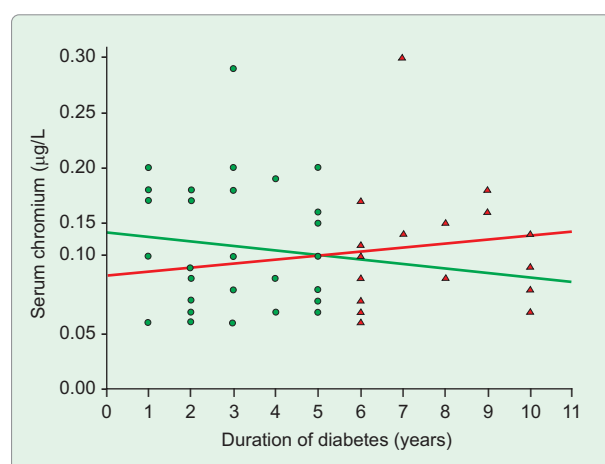
Table III: Correlation of duration of diabetes with serum chromium level in study group (n=50)

Parameters	Group B ₁ Diabetes for 1-5 years (n=32)		Group B ₂ Diabetes for 6-10 years (n=18)	
	r	p	r	p
Serum chromium	0.168	0.357 ^{ns}	+0.271	0.276 ^{ns}

Pearson's correlation coefficient (r) test was performed to compare relationship between parameters. The test of significance was calculated and p value <0.05 was accepted as level of significance.

n = Number of subjects

ns = Not significant

**Figure I:** Correlation between duration of diabetes and serum chromium level in study group (n=50).

Discussion

The goal of this study was to look at the levels of chromium in the blood of people who had type 2 diabetes mellitus. For this, a total number of 50 subjects with type 2 diabetes

mellitus with age ranging from 40 to 55 years. Among them, 25 patients were considered as well as control group and 25 patients were considered as uncontrolled group for comparison. In the study group, height and weight were measured to calculate their body mass index (BMI). Again, systolic and diastolic blood pressure was measured to assess the cardiovascular condition of type 2 diabetic adult subjects. Fasting serum glucose (FSG) level and HbA_{1c} level were also done to observe the glycemic status of the study subjects. Serum chromium (Cr) level was estimated to assess their levels. In this study, age and BMI of all the subjects in both groups were almost similar and statistically no significant differences were observed between them. So, they were matched for age and BMI. In type 2 diabetic patients, there was 14 male and 11 female and in controlled group, there was 15 male and 10 female in uncontrolled group. The mean systolic and diastolic blood pressures were normal limits in both groups. In the present study, that mean serum chromium level was significantly lower in the uncontrolled group in patients with type 2 diabetes mellitus. This finding was in agreement with the study of many researchers of different countries^{9,10,11}. On the contrary, Chinyere et al. 2005 found no significant difference in serum chromium level in type 2 diabetic subjects.¹² In the present study, these correlations were analyzed by Pearson's correlation coefficient (r) test. Patients with duration of type 2 diabetes mellitus were sub-divided into two groups: Group B₁ and Group B₂. Serum chromium level showed negative correlation with group B₁ which showed statistically no significant association and also showed positive correlation with group B₂ which showed statistically no significant association. In type 2 diabetes mellitus, hyperglycemia is the most common symptom. This hyperglycemia increases the osmotic pressure of kidney tubules that inhibits the reabsorption of water by the kidney, resulting polyuria. Due to this polyuria increased excretion of chromium occur in type 2 diabetic patients.^{7,11,13-16} As a result, in type 2 diabetes mellitus, reduced serum chromium levels increase the risk of diabetic complications such as coronary heart disease, hypertension, and atherosclerosis.^{11,18}

Conclusion

The results conclude that serum chromium levels were lower in patients with uncontrolled type 2 diabetes mellitus when compared to controlled type 2 diabetes mellitus and significant lower in serum chromium levels are probable indicators of metabolic response to oxidative stress in type 2 diabetes mellitus patients. Lower level of serum chromium seems to be affected at the same glycemic status in duration of type 2 diabetes mellitus.

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Conflict of Interest: None

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Traumatic Spinal Cord Injury - Management and its Outcome

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Abstract

Background: Traumatic spinal cord injury (TSCI) is a common scenario in the densely crowded roads and highways in a country like Bangladesh. Recently, the accident is going higher and higher. The management protocol in our settings and their outcomes are still to be evaluated. **Objective:** To identify the type of injury of the spinal cord in relation to the mechanism of injury and to observe the outcome of surgical intervention. Study design: Prospective type of observational study. Place of study: Department of Neurosurgery, Combined Military Hospital (CMH), Dhaka. Period of study: December 2016 to May, 2017. Sample size: 30. **Methods:** Patients were enrolled by purposive sampling. They were finalized by eligibility criteria. They were clinically assessed, investigated and the history and clinical profiles were recorded through a pre-tested, peer reviewed data collection sheet. All patients underwent spine surgery. Thereafter, the outcomes of surgery were assessed after 2 months and 4 months later. Thereafter they were compared with pre-operative status. For statistical analysis SPSS version 22 were used and data were compiled, edited, and managed. Data analysis was done. p value was significant at <0.05 . **Results:** Out of 30 patients, the highest number belonged to the age group 31-40 years (40%) which was subsequently followed by 21-30 years age group (30%). The mean age was 33.79 ± 6.01 years where the age range was 18-48 years. 27 (90%) were male and rest 3 (10%) were female. The male to female ratio was 9:1. Among 30 patients, 18 (60%) and 9 (30%) patients had spinal cord injury type D1-S5-AIS-A and D1-S3-AIS-B level respectively. The least number of patients were affected by C1-C7-AIS-A and AIS-E type of spinal cord injury which were only 2 (6.67%) and 1 (3.33%) respectively. The preoperative and postoperative assessment of all 30 patients in terms of Frankel grading, VAS and FIM score; there were statistically significant difference between preoperative and postoperative results in case of Frankel grading ($p=0.05$) and FIM scoring ($p=0.001$) whereas VAS showed none ($p=0.792$). **Conclusion:** It may be concluded here that the decompression and fixation surgery has a nice impact on outcome of traumatic spinal cord injury from different scoring point of view. As a result, it can be added here that the ongoing management system in our perspective is the world standard.

Keywords: Spinal Cord, Rehabilitation, Mobilization, Decompression outcome, Visual Analogue Scale (VAS), Functional Independence Measure (FIM)

Introduction

Traumatic spinal cord injuries are incredibly terrifying situations that often leads to death or disabilities.¹ It affects mainly the young adult population. This damage results in motor, sensory, and autonomic dysfunction, affecting several bodily systems and putting one at risk

for a lifetime of different secondary problems. It is regarded as an unfortunate, tragic occurrence with long-lasting effects on the patient, including repercussions on the lives of family members and society at large. 80% patients are under the age 45 years. Males suffer more. The common cause of TSCI has geographical variations.

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Causes include vehicles crashes (45.4%), fall (16.8%), sports injury (16.3%) and violence. TSCI may cause loss of motor, sensory function of arms, trunk & legs as well as loss of bladder, bowel & sexual function. Injury to the cervical cord leads to quadriplegia. Damage to the sacral or thoracolumbar regions causes paraplegia. This involves impairment to the cauda equina and conus medullaris.² Early diagnosis, immobilization, preservation or restoration of spinal cord function and stability are essential elements of an efficient management strategy for these injuries. Similar to other developing nations, relatively little is known in Bangladesh concerning the precise investigation of spinal cord injuries, particularly among members of the armed services and those connected to them.³ At a social level, young people contribute to high levels of long term disability, morbidity, mortality also impose a substantial economic burden.⁴⁻⁶ Preventive measures are focused to bring down the incidence of spinal cord injuries as well as lower their consequences. These injuries, like the majority of trauma types, are identifiable, nonrandom occurrences that can be avoided with enough knowledge about the underlying causes and patterns of recurrence⁶. Morbidity and mortality rate is high in underdeveloped and developing countries due to inadequate facility and care. Annual incidence of spinal cord injury is 12.1–57.8 cases per million.⁷ Since the majority of victims in underdeveloped nations pass away before arriving at a hospital, the true incidence is higher and more challenging to determine. It was previously linked to extremely high death rates. Now a days, in high-income countries, TSCI can be viewed a personal and social challenge that can be successfully overcome. Conversely, traumatic spinal cord injury frequently persists as a fatal condition in low-income nations. Today's conditions in many developing nations are similar to those of Europe and North America in the 1940s.⁸ An international mapping effort has been launched by the International Spinal Cord Society (ISCoS) to educate stakeholders on the creation and management of preventative programs. The project offers an adjustable structure for a continuous and active data repository.⁹ In keeping with these initiatives, the International Perspectives on Spinal Cord Injury Report was released by the World Health Organization (WHO) and the ISCoS. It highlighted the avoidable and recoverable nature of injuries, their significant personal and social impact, environments and service barriers that limit participation and lower quality of life, and the idea that social inclusion and good health do not necessarily have to be compromised by injury.¹⁰

A model known as the International Classification of Functioning, Disability and Health (ICF) offers the conceptual framework for assessing how an accident or illness affects a person's capacity for participation, activity constraints, and impairments.¹¹ For the purpose of addressing dysfunction and assessing results, it is crucial to employ outcome measures that are based on the quantifiable domains of the ICF. Unfortunately, despite the fact that disease-specific outcome indicators reflect important functioning elements associated to the health condition, their utility in Bangladeshi rehabilitation has not acquired significant progress.^{12,13} Immediate as well as efficient medical treatment from the first instance of the injury and for the length of the person's paralysis are essential for a successful outcome from a spinal cord injury. The most crucial aspect of therapy for people with TSCI is supervised rehabilitation. Rehabilitation research of this kind is necessary since spinal cord injury is a debilitating condition. Our understanding of patient care in the field of rehabilitation will be enhanced by investigating research on this facet of spinal cord injury. A review of the demographics, neurological degree of injury, extent of injury, occurrence, prevalence, injury mechanisms, lethality, and causes of mortality related to traumatic spinal cord injuries is the primary goal of this study. Spinal cord injury patients need multidisciplinary team approach including neurosurgeon, neurologist, orthopedic surgeon and rehabilitation specialist for optimal management, But an appropriate prompt response may make the further treatment smoother and successful.

Materials & Methods

This was a prospective type of observational study. This study was executed in Combined Military Hospital (CMH), Dhaka over a period of December, 2016 to May, 2017. The study population was all entitled patients (Bangladesh Army, Bangladesh Navy and Bangladesh Air Force Personnel's both in service and retired persons & their family, any person in any emergency or critical situation of country, Boarder Guard Bangladesh (BGB), Bangladesh ANSAR & VDP, VIP personnel, Civil Persons in Special situation, any person of national importance) of all ages having Spinal cord injury admitted in CMH, Dhaka. The sample size was 30 and non – randomized purposive method was used for sampling. Patients with spinal cord injury admitted in Combined Military Hospital (CMH), Dhaka as well as patients with spinal cord injury otherwise fit before the incidence was included in the study. Patients having polytrauma and patients with multiple comorbidity were excluded from the study.

Result

Table I: Distribution of patients according to age (n=30)

Age group (in years)	Frequency (%)
≤20	7 (23.33%)
21 – 30	9 (30%)
31 – 40	12 (40%)
>40	2 (6.67%)
Total	30 (100%)
Mean age (in years)	33.79±6.01
Age range (in years)	18 – 48

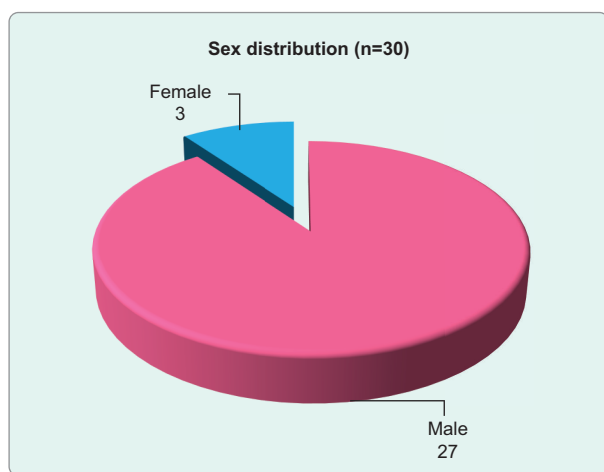


Figure I: Distribution of patients according to sex (n=30)

Table II: Distribution of patients according to etiology/ mode and level of injury (n=30)

Mode/Etiology of injury	Cervical (n=2)	Dorsal (n=6)	Dorso-lumbar (n=12)	Lumbar (n=10)	Total (n=30)
RTA	1 (14.28%)	0 (0%)	6 (85.71%)	0 (0%)	7(%)
Fall from height	1 (5.26%)	4 (21.05%)	4 (21.05%)	10 (52.63%)	19(%)
Other (profession related) causes (n=4)		2 (50%)	2 (50%)	0 (0%)	4(%)

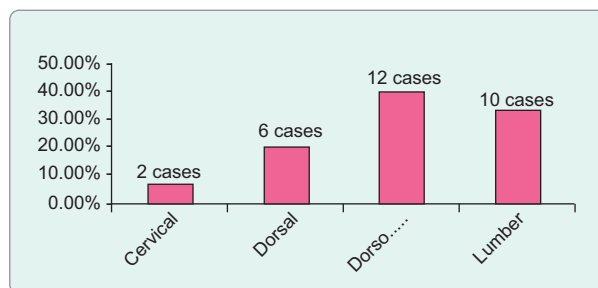


Figure II: Distribution of patients according to level of spinal cord injury (n=30)

Table III: Distribution of patients according to the presence of associated injuries (n=30)

Associated Fractures	Frequency (%)
Thoracic Injury	8 (26.67%)
Long bone fracture	11 (36.67%)
Pelvic fracture	3 (10%)
Soft tissue injury	28 (93.33%)
Abdominal organ injury	5 (16.67%)

Table IV: Distribution of patients by presenting features (n=30)

Presenting Features	Frequency (%)
Urinary incontinence	15 (50%)
Spasticity	13 (43.33%)
Bowel incontinence	11 (36.67%)
Hypotension	9 (30%)
Bed sore	2 (6.67%)

Table V: Distribution of patients according to comparison of preoperative and postoperative Frankel grading (n=30)

Assessment tool	Preoperative (n=30)	Postoperative (n=30)	p-value
Frankel grading			
Grade-B	20 (66.67%)		0.03 ^S
Grade-C	10 (33.33%)		
Grade-D		1 (3.33%)	
Grade-E		29 (96.67%)	

There were statistically significant distinction between the preoperative and postoperative outcomes in case of Frankel grading ($p=0.05$) and FIM scoring ($p=0.001$) whereas VAS showed none ($p=0.792$).

Table VI: Distribution of patients according to comparison of preoperative and postoperative assessment (n=30)

Assessment tool	Preoperative (n=30)	Postoperative (n=30)	P-value
Visual Analogue Score (VAS)	-	-	-
(Mean) (range)	7.22 (6-9)	-	-
At 2 month postoperative (Mean) (range)	-	1.78 (1-3)	0.792 ^{NS}
4 months postoperative (Mean) (range)	-	1.5 (1-4)	-
Functional independence measure (FIM) score (Mean±SD)	92.79±21.76	-	0.001 ^S
2 months postoperative	-	99.24±16.93	-
4 months postoperative	-	108.31±19.71	-

P-value was calculated by chi square test and student t test NS: Not significant S: Significant P-value was significant at <0.05

Discussion

Traumatic spinal cord injuries (TSCI) patients face unknown repercussions for their everyday lives due to motor and sensory abnormalities, as well as bladder and bowel dysfunction. It is crucial to anticipate neurological recovery and functional capacities following rehabilitation in advance so that treatment plans can be developed and communicated to the patient. The neurological and functional results of spinal cord injuries were the main focus of our current study. We have got maximum patients in our study with spinal cord injury were younger. Among 30 patients 31-40 years age group belonged to 12 (40%) patients which were subsequently followed by 9 (30%) 21-30 years age grouped patients. The mean age of the respondents in our study was 33.79 ± 6.01 years. (Age range: 18-48 years). In this study all patients who sustained polytrauma initially was resuscitated by ATLS guideline and then subsequently managed for spinal injury. The study by Zahangir Alam Chowdhury and his colleagues in 2015 showed the similar results in their report.¹⁴ According to a number of studies, patients with spinal cord injuries (TSCI) are often in their third decade of life.¹⁵ Some other studies however report a range from the second to fourth decades.¹⁵ The sex distribution of the study sample showed that among 30 patients, male victims were the highest 90% whereas just 10% of victims were female. The male to female ratio was 9:1. These findings are also consistent with the previous study.¹⁴ In the study of Raja et al¹⁷, in a series of 50 patients, 86% of the patients were male; this finding is consistent with earlier research suggesting that men are more likely than women to experience trauma. It is assumed from the above-mentioned findings that male and younger people are more involved in risky professions as well as more compelled for outdoor movement due to livelihood than female. Fall from the height was detected as the prime cause of spinal cord injury as approximately 63.33% patients experienced this accident. On the contrary, RTA has been ranked as the second highest position with 23.33% patients. These reports are in agreement with Raja RA but Payer showed road traffic accident is the common cause of injury.^{17,18} In our study among 30 patients 93.33% and 36.67% had soft tissue injury and associated long bone fracture respectively. 26.67%, 16.67% and 10% patients had associated thoracic injury, abdominal organ injury and pelvic fracture respectively. The most frequent injury patterns were found to be hyperflexion and axial loading. Most common levels involved was D₁-S₅ AIS-A (60%) followed by D₁-S₃ AIS-B (30%). Among them mostly D₁₂ and L₁ were involved. Raja¹⁷ showed 46% involvement of L₁ and 12% involvement of D₁₂,

coinciding with our results, other study McCormack et al¹⁹ also showed the common level of injury is D₁₂-L₁. Most common grade found in these types of fractures was Frankel grade B (66.67%). It was also noted that more severe the canal compromise, worse the neurological deficit. Hitchon also showed the similar scenario.²⁰ In this study among 30 patients, 15 (50%) and 13 (43.33%) patients were suffering from urinary incontinence and spasticity respectively. Besides, bowel incontinence, hypotension and bed sore were observed among 11 (36.67%), 9 (30%) and 2 (6.67%) patients respectively. Transpedicular screw fixation using a dorsal approach provides a quick, secure, and safe way to achieve stability and correct malalignments in light of advanced design and equipment²¹. Three separate qualified radiologists examined all of the postoperative follow-up X-rays in our study, interpreting them as satisfactory alignment, repositioning, restoration of the spinal column, and postoperative treatment of the kyphotic deformity. It has been demonstrated that posterior decompression with posterior pedicle screw instrumentation can result in a successful restoration of the sagittal curve without causing corrective loss as the fracture heals. The average amount of preoperative kyphosis was 20.44° (range, 10° to 28°) and average correction was of 15.50° (range 10°-25°) at the end of 4 months. Our findings match up to the 11.30° correction shown by Esses et al²². Numerous other investigations also showed that the dorsal approach led to satisfactory neurological recovery, successful repositioning, kyphosis correction, accurate fracture consolidation, and neural decompression, despite the fact that Verlan et al found that, in the case of thoracolumbar spine fractures, no therapy could return the morphology of the vertebral segment to normal physiological values.²³ At pretreatment stage of present series mean (±SD) FIM score of the patients was 92.79 (±21.76). After 2 months of treatment mean FIM score was reached 99.74 (±16.93) and after four months of treatment mean FIM score was reached 108.31 (±19.71) (p value = 0.001). The increase in mean total FIM scores (92.5 -107.32) for the patients from admission to discharge is in line with other studies.¹⁵ For example, People with traumatic SCI often have a mean overall FIM score of 59.5 upon admission and 95.3 upon discharge (mean increase of 35.9), according to Ditunno et al. United Data System for Medical Rehabilitation (UDSMR) data for SCI admissions from 1995 to 1997, with corresponding sample sizes of 3444, 4337, and 4652 cases, revealed lower FIM gains (mean of 26 for 1997) and discharge FIM total scores (means of 89.8 to 88.8

over the three years, respectively) than patients in the current study.²⁴ The total FIM gains for patients in this study were 14.82 point. The findings of this study support the notion that, both upon admission and discharge, patients with TSCI typically exhibit high cognitive FIM scores. It has previously been demonstrated that the FIM is reasonably sensitive to potential changes in cognitive function in this patient group.²⁵

Limitations of the study

It was a prospective type of observational study.

This is single blinded study.

Duration is brief.

Sample size is small.

Does not declare the situation for the entire nation.

Conclusion

It may be concluded here that the decompression and fixation surgery has a nice impact on outcome of traumatic spinal cord injury from different scoring point of view. As a result, it can be added here that the ongoing management system in our perspective is the world standard.

Recommendations

Nested case control study is recommended.

A multicenter, double-blind study conducted throughout Bangladesh's divisional and tertiary hospitals can provide more information.

There should be a lengthy study period.

Multidisciplinary approach of research activity can improve the precision and authenticity of a study.

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Knowledge and Awareness about Substance Abuse among the Secondary School Children in Dhaka City

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Abstract

Background: Substance abuse is an intricate behavior seen to be most prevalent amongst young people across the world. Substance abuse is a challenging problem among adolescent age group in Bangladesh. Even it is completely prohibited but this delinquent behaviour stems in our school. No nation has been spared from the devastating problem caused by drugs and substance abuse. **Objective:** The aim of the study was to assess knowledge and awareness among secondary school students regarding substance abuse in some selected school at Badda, Satarkul, Vatara Thana. **Materials and methods:** This cross-sectional descriptive study was done from November 2021 to February 2022, among 400 secondary school children residing in those areas. Data was collected using a self-administered semi-structured questionnaire with face to face interview. The data were then analyzed using SPSS version 26. **Results:** The result shows that 89% (358) of secondary school students had good knowledge on substance abuse, among them got the information about substance abuse in school 67.03% (240). Regarding the types of substance Ganja, Bhang were predominant 85.75% (307). Most prevalent cause behind the drug abuse was anxiety (70.39%). In case of sign and symptoms of substance abuse most of them told about annoying behavior 80.73% (289), red eyes 68.72% (246), irrelevant talk 61.17% (219) and in response to the place of availability of the substance 74.86% (268) told about the tea stall and betel leaf shops. **Conclusion:** Prevention of drug addiction has already become a great challenge for almost all nations. Substance addiction has direct adverse effects on the addict and his family. It causes educational drop out, financial crisis, domestic violence and destroy family bondage, put the family at risk and lead the family to be isolated from the community and increase criminal activities in the society which ultimately become a major challenge for the country. In this regard family and the government have to play main role and beside them print and electronic media, educational and religious institutions can play a vital role.

Key Words: Substance abuse, Secondary School Children

Introduction

Adolescence is a transitional period marked by substantial changes in physical maturation, cognitive abilities and social interaction. It is a critical and transformative phase of life in which substance use now become a major public health problem. Substance abuse refers to the harmful or hazardous use of psychoactive substances, including alcohol and illicit drugs. Adolescent is the transition period

from childhood to adulthood. Various physical, psychological, social and emotional changes occur during this time and vulnerable time of different influences. In the past two decades substance abuse is an important public health concern among people, especially among adolescents.¹ Globally it is estimated that five million preventable deaths occur every year attributable to substance use.² “Enjoyment” and “Curiosity” were found

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to have the major influence in their decision to use a substance.³ The use of substances has been in existence for thousands of years and has been an integral part of societies. It has penetrated all segments of the society from the urban upper class to lower class in slums. When substances properly administered become a blessing to human beings. People have always used herbs, roots, barks, leaves and all kinds of plants to relieve pain and help control diseases. Unfortunately these substance produce enticing side effects such as euphoria, a sense of feeling good, elation, serenity and power what evolves over time into a problem of dependence and abuse.⁴ Bangladesh is situated in the crucial point between the 'golden triangle' (Myanmar, Thailand and Laos) and the 'golden crescent' (Pakistan, Afghanistan and Iran) in terms of geographical location. Bangladesh with its easy land, sea, and air access is becoming a major transit point. Traffickers who supply substance in the markets of Northern America, Africa, and Europe are routing their shipments through Dhaka, Chittagong, Cumilla, Khulna and other routes in Bangladesh. It ultimately contributes to the number of drug abusers as well. Substance abuse is now prevalent everywhere: in the house, streets, in the workplace, parks, slums, markets and even in educational institutions both in rural and urban areas. Virtually all segments of society are severely affected by this problem. The major illicit drugs available in Bangladesh are opium derivatives (heroin, pethidine), cannabis (marijuana, ganja, chorosh, bhang, hashish), stimulants (yaba, cocaine), sleeping pills, cough syrup (phensidyl, dextopent etc.) and few others. Despite prohibition, alcohol is available across the country and is produced locally. Locally produced alcoholic beverages are made from sorghum, maize, millet, rice, cider, fruit wine or fortified wine (tari, bangla mod, haria, choani, ek chuani, do chuani, mohua, etc.).⁵ Globally, some 35 million people are estimated to suffer from substance use disorders and who require treatment services, according to the latest World Drug Report, released today by the United Nations Office on Drugs and Crime (UNODC). The Report also estimates the number of opioid users at 53 million, up 56 per cent from previous estimates, and that opioids are responsible for two thirds of the 585,000 people who died as a result of drug use in 2017. Globally, 11 million people injected drugs in 2017, of whom 1.4 million live with HIV and 5.6 million with hepatitis C.⁶ Every year, approximately 200,000 people worldwide die from drug-related overdoses. 320,000 young people between the ages of 15-29 die annually from alcohol-related causes, according to the World Health

Organization. Overall, excessive alcohol consumption leads to 2.5 million deaths per year due to accidental and deliberate accidents.⁷ In Bangladesh at the initial stage problem of drug addiction was among the males only but now it has spread among the females also. Men as well as women of the country are being addicted to drugs and their number is increasing geometrically in the country. Only in the year of 2016, 10000 (ten thousand) female students were addicted to yaba. Currently, in Bangladesh, drug addiction has spread almost everywhere of the society. People of higher class as well as lower class, educated as well as uneducated, employed as well as unemployed, men, as well as women, are addicted to drugs. Among 7.5 million drug-addicted people of the country around eighty percent (80%) are young, forty-three percent (43%) are unemployed and fifty percent (50%) of the addicted people are involved in different types of criminal activities. The number of drug-addicted women of the country is also alarming as only in Dhaka University around seventeen percent (17%) of the female residential students are habitually taking illegal drugs. Among drug-addicted people of the country cannabis (marijuana), yaba, (methamphetamine 30% and caffeine 70%) and phensedyl (codine, pseudoephedrine and chlorpheniramine) are very popular. Lower classes people consume mainly cannabis and other low priced drugs and higher classes people consume high priced drugs mainly yaba and phensedyl.⁸ According to a research in Bangladesh, the amount of money drug abusers spent per year per person was much higher than the per-capita income of Bangladeshi people.⁹ In order to prevent substance' abuse among adolescents, the properties and targeting risk factors that put youth at risk should be identified. Several investigations have aimed to distinguish risk factors associated with adolescent drug and alcohol usage.

Material and Methods

This study was conducted as a cross-sectional descriptive research design from November 2021 to February 2022 among secondary school children residing in Badda, Satarkl, Vatar Thana and who are going to local school. Sample size was 400. Among them 358 had good knowledge on substance abuse and 42 had no knowledge on substance abuse. Data was collected using a self-administered semi-structured questionnaire with face to face interview. The data were then compiled and tabulated manually according to key variable in master sheet. Then finally data were analyzed in computer using MS word and MS Xcel.

Results

Table I: Socio-demographic characteristics of the respondents (n=400)

Characteristics	Group	Frequency (n)	Percentage (%)
Age (years)	10- 12	31	7.8
	12-14	147	36.8
	14-16	192	48.0
	Å 16	30	7.5
Religion	Muslim	381	94
	Hindu	10	2.5
	Christian	6	1.5
	Buddha	3	0.8
Sex	Male	223	55.8
	Female	177	44.2
Family type	Nuclear	302	75
	Joint	98	25
Study in Class	Class VII	64	16.0
	Class VIII	105	26.3
	Class IX	111	27.8
	Class X	120	30.0
Type of residence	House	380	95.0
	Hostel	20	5.0
With whom they are staying	Parents	372	93.0
	Friends	20	5.0
	Cousin	2	0.5
	Brothers	3	0.8
	Uncles	3	0.8
Number of family members	2 Member	43	10.8
	3 Member	147	36.8
	4 Member	117	29.3
	5 Member	93	23.3
Fathers education	Primary	36	9.0
	Secondary	81	20.3
	Higher secondary	88	22.0
	Graduate	89	22.3
	Post graduate	63	15.8
	Illiterate	43	10.8
Fathers occupation	Farmer	11	2.8
	Service	153	38.3
	Day labour	23	5.8
	Teacher	7	1.8
	Business	201	50.3
	Others	5	1.3
Mothers education	Primary	63	15.8
	Secondary	105	26.3
	Higher secondary	99	24.8
	Graduate	51	12.8
	Post graduate	31	7.8
	Illiterate	51	12.8
Mothers occupation	Housewife	341	85.3
	Service	36	9.0
	Day labour	4	1.0
	Teacher	14	3.5
	Business	5	1.3

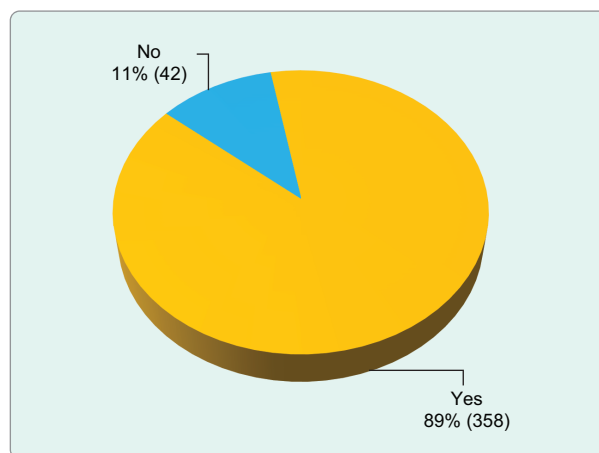


Figure I: Distribution of the respondents regarding knowledge on substance abuse (n=400)

Table II: Distribution of the respondents by source of information about substance abuse (n=358)

Source of information about drug abuse	Frequency (n)	Percentage (%)
School	240	67.03
Friends	131	36.59
Radio/ TV/ internet/News paper/Magazine	197	55.03
Social gathering	51	14.25
Others	35	9.78

*Multiple responses

Table III: Distribution of the respondents by mentioning types of substance (n=358)

Types of drugs	Frequency (n)	Percentage (%)
Bidi, Cigarrate	291	81.28
Wine	295	82.40
Ganja, Bhang	307	85.75
Yaba	283	79.0
Phensidyl	209	58.38
Heroin	211	58.94
Sleeping pill	142	39.66
Others	9	2.51

*Multiple responses

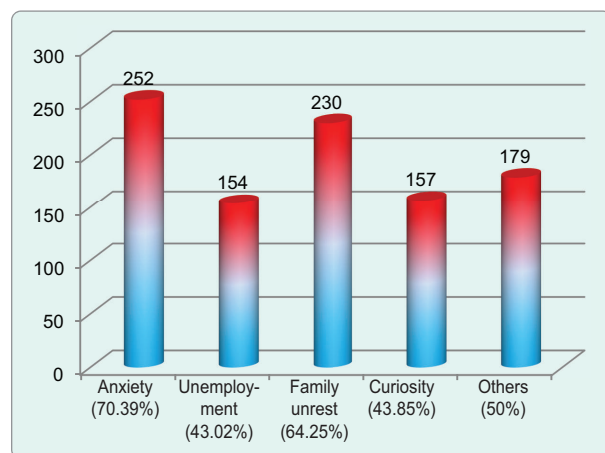


Figure II: Distribution of the respondents by opinion on causes behind the substance abuse (n=358).

*Multiple responses

Table IV: Distribution of the respondents by opinion on sign and symptom of substance abuse (n=358)

Sign and symptom of drug abuse	Frequency (n)	Percentage (%)
Annoying behavior	289	80.73
Irrelevant talk	219	61.17
Red eyes	246	68.72
Untimely sleep	158	44.13
Weight loss	111	31.01
Others	27	7.54

*Multiple responses

Table V: Distribution of the respondents by mentioning the places where substance are available (n=358)

Where drugs are available	Frequency (n)	Percentage (%)
Tea stall and betel leaf shops	268	74.86
Medicine shops	134	37.43
Slums	217	60.61
Bidi cigarette shops	191	53.35
Others	39	10.89

*Multiple responses

Discussion

Substance abuse is the critical and multidimensional problem of Bangladesh. It affects every aspect of individual, family, social life and national prosperity. The aim of this study was to assess the level of knowledge regarding substance abuse among the secondary school children in Dhaka city. The result from our study showed

that there was good knowledge of substance abuse among secondary school children in Dhaka city which is supported by studies done by Yahyah B. M,¹⁰ Haddad L,¹¹ Bhattarai J,¹² Divya T,¹³ Damilola O,¹⁴ and not supported by the study done by Kamenderi M,¹⁵ where students were fairly knowledgeable on the different drugs and substances of abuse. The major sources of information were shown that school was the most common source of information (67.03%) followed by radio/ TV/ internet/news paper/ magazine which was agreed with the study done by Umukoro EK¹⁶ not agree with studies done by Idowu A,¹⁷ Gotsang G.¹⁸ Out of 358 respondents 85.75% mentioned the name of Ganja and Bhang as most common types of substance used by secondary school children. Findings shown in previous studies done by Gurung A,¹⁹ Mahmood N,²⁰ but Rahman FN²¹ found Barbiturate/ sedatives was commonly used substance. Another study done by Marygoretty E²² and King'endo M²³ found Alcohol was commonly used Substance. Regarding the opinion of the abusers about reasons behind the use of substances, it was found in our study that 70.39% of the abusers disclosed that anxiety were the main reasons for substances abuse. Other important indications for the reasons behind the substance abuse were family unrest (64.25%), followed by curiosity (43.85%), Unemployment (43.02%). Our finding was in accordance to the study done by Alawi ASHA et al.²⁴ and not accordance to the study done by Bassi AP²⁵ where curiosity was the reasons behind the use of substances, 51% of the participants stated that love failure was the common cause for substance addiction in the study done by Sandhya ST.²⁶ Regarding feeling of physical and mental effects after drug addiction, the results of our study revealed that all of the substance users feeling after substance addiction was annoying behavior 80.73% then followed by red eyes 68.72%, irrelevant talk 61.17%. A study done by Islam A among substance addicted found that sense of perception doesn't work (100.0%), feeling dizziness until taking substance (100.0%) and decreased working capability and stability (100.0%), all of the substance users feeling after substance addiction was lack of discipline in daily life (80.0%), few of the substance users feeling after substance addiction was insomnia (20.0%), hallucination syndromes (20.0%), sexual problem (15.0%) and physical impatience (10.0%), increased head-ache (10.0%), and abnormal behavior (10.0%).²⁷ In response to the places where substance are available 74.86% told about tea stall and betel leaf shops.

Conclusion

The easy availability of substance in our community is an important contributory factor for substance abuse. So,

some intervention should be done for reducing availability of substance. This study provides information about prevalence of substance abuse in our community. If the substance abuse among our school children is increasing, it not only affects the physical and mental health of individual involved but it can impede the nation's economic, educational and social growth. So, policy makers, health workers, teachers, parents and social workers must work in collaboration to build awareness against substance abuse so that problem could not get worse in future.

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Effectiveness of Online Teaching Learning Activities during Covid-19 Period of MBBS Students of a Government Medical College

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Abstract

Background: Since WHO declared the COVID-19 pandemic, a public health emergency of International concern, more than 20 million cases have been reported, as of Aug 24, 2020. This study aimed to identify the effectiveness of online teaching-learning activities during Covid-19 Period of MBBS students, Comilla Medical College. **Objectives:** To identify the students' progress regarding through the online approaches; to determine the students' awareness about the increase of knowledge level; to examine the effectiveness of teaching techniques about online approach the consideration of face to face (Offline) approach and to assess the preventive knowledge of students about Covid-19. **Materials & Methods:** The descriptive cross-sectional study was conducted to assess the effectiveness of online teaching learning activities during Covid-19 period among MBBS students in Cumilla Medical College. The study was done purposively and sample size was 132. Study period was from 10th September to 30th December 2021. Data collection method was mail questionnaire by Google form. Statistical analysis was done by SPSS Version 23 & data presented by tables, charts, figures, statistical inferences. **Results:** Among the 1st year, 3rd year, 4th year and 5th year students, average numbers of attending classes were 106, 30, 35.54 and 118.93 respectively and among all the students average number of classes attended was 74.65. Considering the effectiveness of online classes, 20% of the 4th year students found it was very effective, 45.7% of the 4th year students found it was effective, 58.6% of the 3rd year students found it was average effective, 60% of 1st year students and 45.8% if 5th year students found it was below effective, 20% of 1st year and 4th year students found it was not effective. Regarding attention of online classes 10.4% of 1st year students told excellent, 54.3% of 4th year students told very good, 34.3% of 4th year students told good, 65% of 1st year students told below good and 20% of 1st year students told not good at all. in case of completion of syllabus through online class within covid-19 period, all (100%) of 1st year students told not able to complete the syllabus, 25.7% of 4th year students said sometime able to complete syllabus through online class, 14.3% of 4th year students said able to complete syllabus through online class. In our study we found teachers were full prepared in 4th year class (82.9%), 1st year class (40%), 3rd year class (34.5%), 5th year class (29.9%). Teachers are prepared in 5th year class (54.2%), 3rd year class (51.7%), 1st year class (40%), 4th year class (14.3%). Teachers conduct the session with previous preparation in 1st year class (20%), 3rd year class (13.8%), 5th year class (12.5%), 4th year class (2.9%). **Conclusion:** Effectiveness of online teaching learning faces some weakness and threats such as network problem, lack of concentration to the classes, family members affected by corona virus etc. Within these periods, through online classes students were still connected with their study activities.

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Introduction

The Covid-19 has resulted in schools shutdown all across the world. Globally, over 1.2 billion children are out of the classroom. As a result, education has changed dramatically, with the distinctive rise of e-learning, whereby teaching is undertaken remotely and on digital platforms. Research suggests that online learning has been shown to increase retention of information, and take less time. With this sudden shift away from the classroom in many parts of the globe, some are wondering whether the adoption of online learning will continue to persist post-pandemic, and how such a shift would impact the worldwide education market. For those who do have access to the right technology, there is evidence that learning online can be more effective in a number of ways. Some research shows that on average, students retain 25-60% more material when learning online compared to only 8-10% in a classroom. This is mostly due to the students being able to learn faster online; e-learning requires 40-60% less time to learn than in a traditional classroom setting because students can learn at their own place, going back and re-reading, skipping, or accelerating through concepts as they choose. Major world events are often an inflection point for rapid innovation—a clear example is the rise of e-commerce post-SARS. While we have yet to see whether this will apply to e-learning post-Covid-19, it is one of the few sectors where investment has not dried up. What has been made clear through this pandemic is the importance of disseminating knowledge across borders, companies, and all parts of society. If online learning technology can play a role here, it is incumbent upon all of us to explore its full potential.¹ According to The Financial Express, 20 October 2020, The Covid-19 outbreak has disrupted the academic year, cancelled classes and examinations of students across the globe. Thus the educational institutions moved classes online encouraging students to attend lectures via electronic devices. This has also sparked a debate on whether the increased amount of screen time helps students learn or if it impedes their progress.² In Bangladesh online teaching-learning began as internet in 1960 as a Radiobroadcast followed by a pilot project School Broadcasting Program (SBP) in 1980 and then expanded by the establishment of the National Institute of Educational Media and Technology (NIEMT).³ The objectives of study are as to identify the students' progress regarding through the Online approaches; to determine the students' awareness about the increase of knowledge level; to realise the effectiveness of teaching techniques about online

approach the consideration of face to face approach and to assess the preventive knowledge of students about covid-19. Medical colleges are known for their intense curriculum and workload. They have adhered to their traditional in-house lectures and bedside teaching since a long time. The pandemic brought a diabolic change in this vigorous teaching schedule. Doctors and healthcare workers being the backbone of the community's fight against pandemic are already in testing times. It was difficult at first for medical colleges to adapt but with the passage of time and dawn of realization, they were quick to resort. Our experience with online teaching has not been a smooth sail either. There is poor internet connectivity in some areas, which is partly even due to heavy traffic many other medical institutes, is also trying its level best to provide quality education to students. There are several factors that act as barriers for online education as a) academic skills, b) technical skills, c) cost and internet access, d) time and motivation for studies and e) technical issues, etc.⁴ Cumilla Medical College teachers took the decision to conduct online classes considering the students better result. The class contents are selected according to the syllabus with different teaching techniques. The National Medical Commission (NMC) of India which regulates the medical education has clarified that online theory classes are valid for MBBS students.

Materials & Methods

The descriptive cross-sectional study was conducted to assess the effectiveness of online teaching learning activities during Covid-19 period among MBBS students in Cumilla Medical College. The study was done purposively and the respondents were the medical students in different years of MBBS classes. The total number of students, n=132 (5th year-48, 4th year-35, 3rd year-29 & 1st year-20). Study period was from 10th September to 30th December 2021. Study population was medical students of all years. As the questionnaire was in Google format and the medical students were continuing their classes online, so if there was network problem or the students refused to give their opinion they were included in exclusion criteria. On the other hand, those students who were in good network coverage and willingly agreed to give their opinion were included in inclusion criteria. Data collection tool was pretested mixed type semi structured questionnaire. Data collection method was mail questionnaire by Google form. Statistical analysis was done by SPSS Version 23 & data presented by tables, charts, figures, statistical inferences.

Results

Table I: Attendance of online class (n=132)

Number of attending class	1st year (n=20)	3rd year (n=29)	4th year (n=35)	5th year (n=48)	Combined (n=132)
Mean	106	30	35.54	118.93	74.65
Standard deviation	9.40	0.00	2.66	23.77	43.90
Minimum	100	30	34	40	30
Maximum	120	30	40	155	155

Table II: Effectiveness of online class during the covid-19 period (n=132)

Effectiveness of online class	1st year (n=20) (%)	3rd year (n=29)(%)	4th year (n=35)(%)	5th year (n=48)(%)
Very effective	0.0	3.4	20.0	10.4
Effective	0.0	6.9	45.7	20.8
Average effective	20.0	58.6	17.1	18.8
Below effective	60.0	31.0	17.1	45.8
Not effective	20.0	0.0	20.0	4.2
Total	100.0	100	100	100.0

Table III: Complete the syllabus during covid-19 period through online class (n=132)

Able to complete the syllabus within covid-19 period	1st year (n=20) (%)	3rd year (n=29) (%)	4th year (n=35) (%)	5th year (n=48) (%)
Able to complete syllabus	0.0	3.4	14.3	0.0
Sometime able to complete syllabus	0.0	3.4	25.7	20.8
Not able to complete the syllabus	100.0	93.1	60.0	79.2
Total	100.0	100.0	100.0	100.0

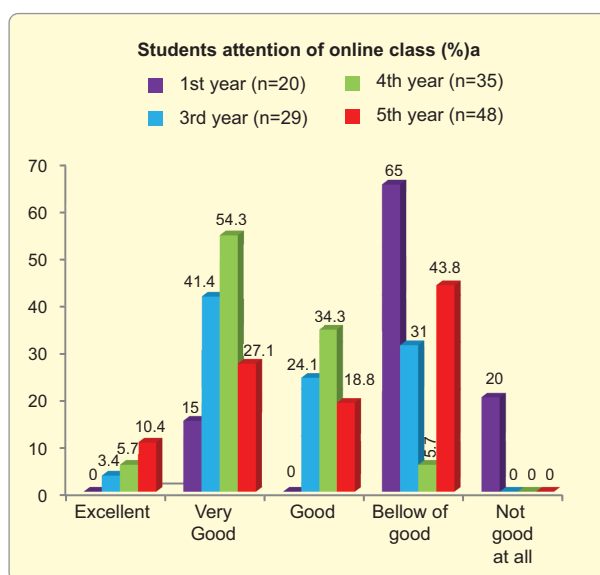


Figure I: Attention in online class

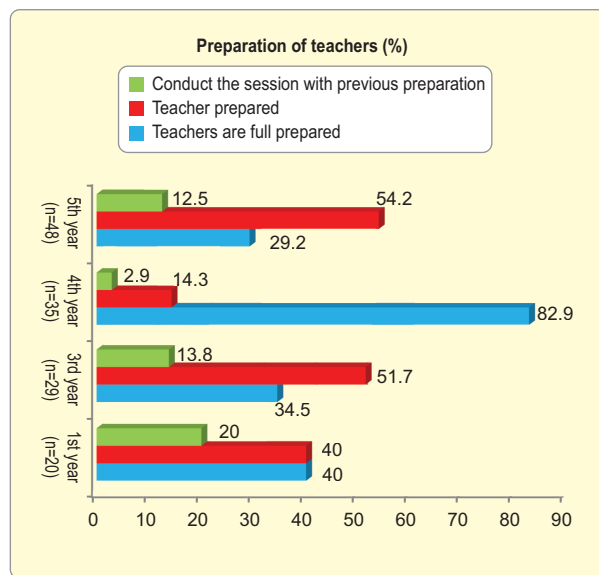


Figure-II: Preparation of teachers for online class (n=132)

Discussion

The COVID -19 made us realize the importance of online classes as a substitute of the regular classrooms, in times of pandemic situation. In the present study conducted on 132 medical students in Cumilla Medical College during the COVID-19 pandemic. In the absence of this venture, majority of med colleges had stopped the classes totally in this time. Medical teachers, as doctors, are already the frontline corona warriors in the community's fight against this pandemic. Among the 1st year, 3rd year, 4th year and 5th year students, average numbers of attending classes were 106, 30, 35.54 and 118.93 respectively and among all the students average number of classes attended was 74.65. A study done by Tuladhar SL et al. found amongst the students who responded, majority 205(98.1%) were attending online classes regularly.⁵ Dilip et al. found in their study that the average attendance for online classes was significantly higher over offline classes ($p < 0.0001$).⁶ Considering the effectiveness of online classes, 20% of the 4th year students told it was very effective, 45.7% of the 4th year students told it was effective, 58.6% of the 3rd year students told it was average effective, 60% of 1st year students and 45.8% if 5th year students told it was below effective, 20% of 1st year and 4th year students told it was not effective. Chaudhuri A et al. noticed in their study that about 77.1% were satisfied with the online support, 86.1% felt that regular assessment and feedback provided to them were beneficial, and 11.4% had difficulty in studying physiology in online mode.⁷ Regarding attention of online classes 10.4% of 1st year students found excellent, 54.3% of 4th year students found very good, 34.3% of 4th year students found good, 65% of 1st year students found below good and 20% of 1st year students found not good at all. A survey done by Grover S et al. in India found majority of the participants reported 38.9% and 10.6% rated online theory and online practical classes as 'good' or 'very good,' respectively.⁸ Swe KMM et al. found in their study most of the students (52.4%) rated the overall satisfaction of online teaching experiences "Very good" while (13.1) % rated "Excellent".⁹ In case of completion of syllabus through online class within covid-19 period, all (100%) of 1st year students told not able to complete the syllabus, 25.7% of 4th year students said sometime able to complete syllabus through online class, 14.3% of 4th year students said able to complete syllabus through online class. Mollah MAH et al. done a study among Rajshahi University students in 2020 and the crucial finding of this study was online classes were not fruitful for a long time as higher education is highly technical, professional, and specialized

and based on a practical, lab test, and field survey.¹⁰ Lahon J et al. found in their study that about 40.5% were satisfied with the curriculum set for the class, while 36.6% of respondents disagreed that online class is a possible substitute for conventional classroom teaching, 32.8% disagreed that e-learning could be applied easily in India.

¹¹ In our study we found teachers were full prepared in 4th year class (82.9%), 1st year class (40%), 3rd year class (34.5%), 5th year class (29.9%). Teachers are prepared in 5th year class (54.2%), 3rd year class (51.7%), 1st year class (40%), 4th year class (14.3%). Teachers conduct the session with previous preparation in 1st year class (20%), 3rd year class (13.8%), 5th year class (12.5%), 4th year class (2.9%).

Conclusion

The effectiveness of online teaching-learning activities and examination system in medical college students are still relatively new; however, it has the potential to become mainstream in the near future. Delivering the required activities with desirable outcomes adopting innovative ways will continue to remain a challenge for medical students learning process. In the midst of the COVID-19 crisis, it is crucial that the medical educators' community puts its academic experience into practice and prioritizes a forward-thinking and scholarly vision to bring out practical solutions for the benefit of medical students. Effectiveness of online teaching learning faces some weakness and threats such as network problem, lack of concentration in online classes, family members affected by corona virus etc. Now, it is about the challenge of adapting the new to normal; that is the virtual world, till we get back to physically being available in our medical colleges again.

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Tuberculosis in Children: Variation and Treatment Outcome in a Tertiary Care Hospital in Bangladesh

Qamruzzaman K¹, Rahman MA², Tauhid SA³, Mollah LR⁴, Rahman MM⁵, Hossain MM⁶, Muqta S⁷

Abstract

Background: Tuberculosis (TB) in children shows varied clinical manifestations, making diagnosis and treatment challenging due to differences in immune response and disease progression compared to adults. In Bangladesh, TB is a significant public health issue, with tertiary care hospitals crucial for managing complex cases. Understanding the variation in clinical presentation and treatment outcomes is key to optimizing care strategies and improving prognosis. **Objective:** To analyze the variation in presentation and treatment outcomes of pediatric tuberculosis cases in a tertiary care hospital in Bangladesh. **Materials and methods:** This descriptive study was carried out at Sir Salimullah Medical College Mitford Hospital in Dhaka, Bangladesh, from August 2021 to August 2022. 280 children diagnosed with tuberculosis were selected using purposive sampling. The data were analyzed using MS Office tools. **Results:** In the study, 51.1% (143) of the participants were diagnosed with pulmonary tuberculosis (PTB), and 48.9% (137) had extra-pulmonary tuberculosis (EPTB). The majority were young girls between the ages of 5 and 10. All patients exhibited fever, followed by symptoms of cough with sputum production (51%), anorexia, and weight loss (51%). There was a common history of contact with TB. Out of the participants, 185 (66%) completed treatment and achieved cure, 10 (3.6%) completed treatment without being cured, 14 (5%) were still in treatment, 25 (8.9%) discontinued treatment, 7 (2.5%) defaulted, 6 (2.1%) were lost to follow-up, and 3.8% passed away. The treatment success rate stood at 94.9%. **Conclusion:** Pulmonary tuberculosis (TB) is common among pediatric patients and typically presents with symptoms such as fever and cough. While some patients may discontinue treatment, the majority are successfully cured using the appropriate anti-TB medications. The Directly Observed Treatment, Short-course (DOTS) strategy has proven effective, with no reported adverse effects from the drugs.

Keywords: Anti-tubercular therapy, Extrapulmonary TB, Gene X-pert ultra, TB lymphadenitis, Tuberculosis.

Introduction

Childhood tuberculosis (TB) continues to be a significant global health concern. The World Health Organization (WHO) reports that in 2017, 10 million individuals

developed TB, including 1 million children younger than 15 years. ¹ Diagnosing pediatric TB typically involves evaluating contact history, assessing clinical symptoms, conducting chest radiography, performing tuberculin skin

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testing (TST), and analyzing microbiological data. Despite these methods, children with TB may present with non-specific symptoms and unclear chest X-ray findings. ¹Accurately diagnosing pediatric tuberculosis is difficult. Positivity for acid-fast bacilli in sputum occurs in less than 15% of children, and mycobacterial culture yields range from 30% to 40%.^{2, 3} Childhood TB makes up about 9% of TB cases worldwide, and this proportion can rise to 15% in low-income countries. ^t TB control programs often concentrate on detecting highly contagious adult cases with sputum smear-positive results, which leads to the neglect of childhood TB due to diagnostic difficulties and an overestimation of the BCG vaccine's effectiveness. ^u Additionally, diagnosing TB in resource-limited settings, such as Bangladesh, is even more challenging. Concerns about TB in HIV-positive children are growing. ^v Studies from various countries have examined the epidemiology and clinical features of childhood TB, but these findings often depend on the regional TB and HIV contexts. Diagnosing TB in children is particularly tough in resource-limited settings like Nepal, where there is a high TB burden. ^w Collecting sputum samples from children, especially those under 7, is challenging as they often cannot provide sufficient or quality samples for testing. Diagnosing active TB in children is more complicated than in adults because the bacteria are less frequently detectable, and symptoms may differ. Without bacteriological confirmation, the diagnosis of childhood tuberculosis (TB) often relies on a combination of (1) close contact with an infectious index patient, (2) a positive tuberculin skin test (TST), and (3) the presence of suggestive abnormalities on a chest radiograph. ^x These criteria, however, are not widely applicable in TB-endemic countries due to several challenges. Case detection and contact tracing are not regularly implemented in national TB programs, transmission often occurs beyond the household, and many individuals are exposed to TB and become TST-positive during childhood or adolescence. ^y ¹p Consequently, this study aimed to offer insights into the clinical as well as epidemiological traits of pediatric pulmonary TB (PTB) and extrapulmonary TB (EPTB) patients, along with the diagnostic procedures involved. The objective of this study was to evaluate the prevalence of pulmonary tuberculosis (PTB) and extrapulmonary tuberculosis (EPTB), assess their clinical profiles and diagnostic methods, and observe the treatment outcomes of anti-tubercular therapy up to six months after enrollment.

Materials and methods

This descriptive study was conducted in the Department of Pediatrics at the Sir Salimullah Medical College Mitford Hospital (SSMCMH) in Dhaka, Bangladesh, spanning from August 2021 to August 2022. The research obtained ethical clearance from the institutional ethical clearance committee of the hospital. After obtaining informed consent, participants were selected based on specific inclusion and exclusion criteria. The inclusion criteria comprised all children clinically suspected and newly diagnosed with tuberculosis, aged 12 years or younger. The exclusion criteria included children who did not meet the diagnostic criteria for TB and cases where parents were unwilling to provide consent. The study enrolled a total sample size of 280 children diagnosed with tuberculosis, involving both outpatients and inpatients. Study Procedure: A total of 280 TB patients, all 12 years old or younger, qualified under the study's inclusion and exclusion criteria. These participants were briefed on the study's objectives and potential benefits. Every child presenting to the SSMCMH outpatient department with symptoms indicative of tuberculosis underwent an investigation to confirm the disease. Once written informed consent was secured, researchers collected demographic information, detailed clinical histories, family contact histories, and physical examination findings for each child. All children underwent a complete blood count, Mantoux test, and chest X-ray. Depending on the diagnostic needs, additional tests were performed, including fine needle aspiration cytology (FNAC), ultrasound (USG) of the abdomen, chest and spine X-rays, lumbar puncture (LP), CT scans, MRI, and other relevant investigations. Sputum and stool samples were analyzed for Gene Xpert and Gene Xpert Ultra as needed. In certain cases, gastric lavage was conducted for acid-fast bacilli (AFB) staining and Gene Xpert testing. Children from both the outpatient (OPD) and inpatient departments were assessed and enrolled in the study. Among the 280 cases, 209 children returned for follow-up appointments at scheduled intervals: one month, two months, and shortly before completing six months of Anti-TB (ATB) treatment. To facilitate adherence, reminders were sent to parents via mobile phone. All children received ATB treatment either at the hospital's DOT Center or another accessible treatment location. Data from the study were inputted into SPSS 23 for analysis.

Results

Table I: Socio-demographic characteristics of cases (n=280)

Characteristics	Frequency(n)	Percentage(%)
Age distribution (Year)		
<5	70	25
5-10	124	44.29
11-12	86	30.71
Gender distribution		
Male	127	45.36
Female	153	54.64
Socio economic status		
Low	106	37.86
Middle	134	47.86
High	40	14.28

Table II: Clinical symptoms (n=280)

Presenting symptoms	Frequency(n)	Percentage(%)
Cough with sputum	143	51.07
Anorexia and weight loss	143	51.07
Fever	280	100
Shortness of breath	8	2.86
Back pain	21	7.50
Headache	2	0.71
Disorientation	3	1.07
Ascites	30	10.71

The data presented in Fig. I reveal that most participants, 143 cases (51.07%), were diagnosed with pulmonary TB. In contrast, the remaining 137 cases (48.93%) were identified as having extrapulmonary TB.

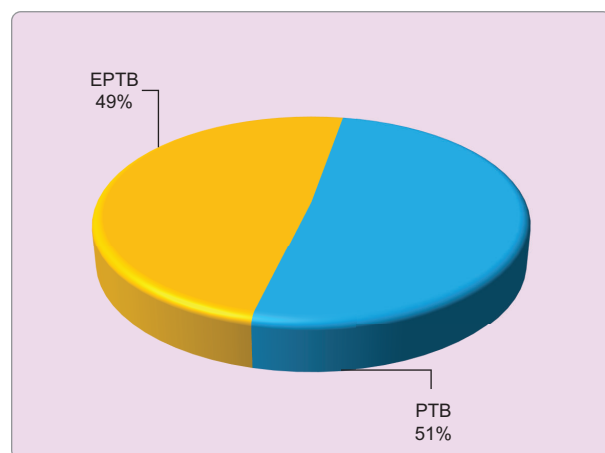


Figure I: Types of tuberculosis (n=280)

Table III: Organ involvement of EPTB (n=137)

Types of EPTB	Frequency(n)	Percentage(%)
TB lymphadenitis	61	44.52
TB meningitis	1	0.73
Pleural effusion	8	5.84
Pott's disease	20	14.60
Abdominal TB	30	21.90
Miliary TB	17	12.41

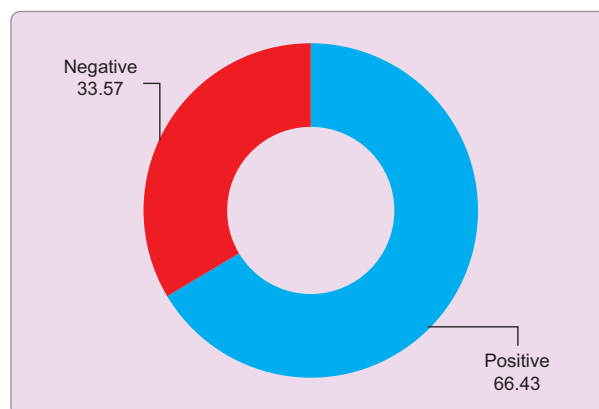


Figure II: Distribution of history of TB contact (n=280)

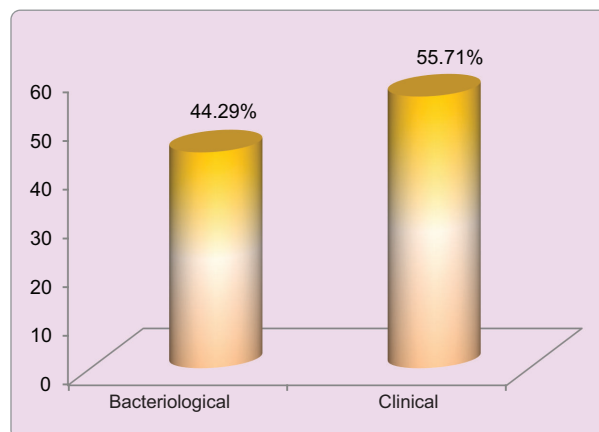


Figure III: Initial detection of tuberculosis (n=280)

Table IV: Investigations findings (n=280)

Variables	Frequency(n)	Percentage(%)
CBC with ESR	4	1.43
Sputum for Gene X-pert	66	23.57
MT	55	19.60
Chest X-Ray P/A view	56	20
FNAC & LN biopsy	56	20
Stool for Gene x-pert Ultra	34	12.14
CSF study	1	0.36
Pleural fluid study	8	2.86

Table V: Treatment outcomes of PTB and EPTB

Outcomes	Types	
	PTB	EPTB
	(n=143)	(n=137)
	Frequency (Percentage) % (n)	Frequency (Percentage) % (n)
Cured	69.2 (99)	62.8(86)
Treatment failed	3.5(5)	3.6(5)
Treatment ongoing	0.7(1)	9.5(13)
Switch off	10.5(15)	7.3(10)
Defaulted	2.8(4)	2.2(3)
Lost to follow-up	2.1(3)	2.2(3)
Death	4.2(6)	3.6(5)
Untreated	7(10)	8.8(12)

Discussion

In this study, the characteristics of pediatric patients with PTB and EPTB were analyzed. The largest proportion of participants (44.29%) fell within the 5 to 10 years age group. In contrast, R Ksoo et al. found that most patients were under 5 years of age, while Wang et al. reported their patients had a mean age of 9.11 ± 4.39 years.^{11,12} These differences might be due to environmental or geographical factors. The study also observed an almost equal number of male and female participants, with a slight female predominance. However, other studies^{12,13} have reported a predominance of male participants. In terms of socioeconomic status, the largest group among our participants was from the middle-class category, with about one-third from low-income backgrounds. Another study¹⁴ found a significant number of participants came from low socioeconomic backgrounds. All cases in this study experienced fever, and the majority also presented with cough with sputum and anorexia with weight loss. Similar symptoms were noted in other studies.^{12,13} Additionally, this study revealed that 267 participants (66.43%) had a confirmed history of contact with TB, while 33.57% did not have a confirmed history. Among our total TB cases, the majority were diagnosed based on clinical evaluation (55.71%), while 44.29% were identified through bacteriological testing. This study revealed that most cases were clinically diagnosed with pulmonary TB. However, extrapulmonary TB was the most common finding in other studies, even when their study populations included children under 15 years old.^{14,15} In this study, TB lymphadenitis was the most common presentation, followed by abdominal TB. An Indian study also found that TB lymphadenitis was the prevalent form of extrapulmonary tuberculosis, which is almost comparable

to this study.¹⁶ Nearly one-fourth of the cases had cervical lymphadenopathy, while 8.76% presented with both abdominal and axillary lymphadenopathy. A recent study reported that peripheral tuberculous lymphadenitis can occur in the context of a primary infection, typically seen in young children and immunocompromised patients.¹⁷ It may also indicate the reactivation of a prior primary infection. In this study, regarding treatment outcomes, 66% of participants completed treatment and were cured; 3.6% completed treatment but weren't cured; and 3.8% passed away. The treatment success rate was 94.9%. In another study, among 56 children whose treatment outcomes were recorded, 69.6% completed treatment, 28.5% were cured, and 1.7% experienced treatment failure. Siamisang et al. reported a treatment success rate of 93.1% in Botswana from 2008 to 2019. In Ethiopia, Weldegebreel et al. found a treatment success rate of 88.6% from September 1, 2017, to January 30, 2018.¹⁹⁻²¹ A major limitation of this study was the smaller sample size, which made it challenging to draw definitive conclusions about the efficacy of conventional anti-TB drugs in children.

Conclusion

Pulmonary tuberculosis (TB) remains prevalent among pediatric patients, often presenting with fever and cough. This study highlights that even though some patients discontinue treatment, most achieve a cure with the right anti-TB drugs. The effectiveness of the Directly Observed Treatment, Short-course (DOTS) strategy in promoting treatment adherence leads to successful outcomes, without notable adverse effects from the medications. Future efforts should focus on improving patient adherence and continuing to monitor any potential side effects to maintain and enhance treatment success.

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Patient's Satisfaction about Quality and Amenities of Food in Combined Military Hospital, Bogura

Hossain MZ¹, Ferdous A²

Abstract

Background: Patient's satisfaction has developed an important standard by which quality of health maintenance amenities is assessed. Quality of food and its amenity in hospital is a significant constituent of treatment procedure meanwhile it sometimes is a fragment of treatment and frequently touches the patient's satisfaction. Objectives: To evaluate the degree of patient's satisfaction about quality of food and amenities and to recognize the reasons upsetting it. **Materials and Methods:** This cross-sectional observational study was accomplished from August 2022 to October 2022 in Combined Military Hospital, Savar. Organized questionnaires were utilized by way of data collection instruments and were examined by SPSS version 19. **Results:** Out of 120 respondent's, majority (59.2%) were satisfied with hospital food and food services. About 93.3%, 72.5%, 88.3%, 85%, 83.3% and 77.5 % respondents were satisfied with amount, warmth, cleanliness of utensils, cleanliness of food servers, attitude and behavior of food servers and food distribution time respectively. In examination result presented that taste of food, food distribution time, cleanliness of food servers and cleanliness of ward/cabin were statistically significant and most important determinants of patient's satisfaction with the food served in hospital. **Conclusion:** Enlightening taste of food, confirming cleanliness of the food servers and ward and correcting food distribution time are 'recommended to expand the degree of complete patients' satisfaction towards hospital food and food amenities.

Key-words: Patients' satisfaction, Quality of hospital food, Hospital food amenities.

Introduction

Patient's satisfaction rating is a personal evaluation of health care services and providers.¹ In the current period, the quality of health care amenity is being assessed by the patient satisfaction.² The measurement of regaining and quality of life of a patient is exaggerated by the food amenity in a hospital which is one of the significant mechanisms of treatment process.³ Observing patient's satisfaction with food amenities in the hospitals is one approach to prevent malnourishment, as research obviously discloses that when patient's satisfaction with the food and food amenities declines, the risk for malnutrition increases⁴. A wide ranging literature evaluation exposes that number of studies took place in the health care facilities as well as other service providers, but studies on the satisfaction with food and food amenities

in health care facilities is relatively low.⁵ Once more, there is shortage of academic work on patient satisfaction with food amenity in the background of military hospitals particularly in Bangladesh Military. Therefore, this academic work is an attempt to permeate the prevailing information hole on hospital food amenities and degree of satisfaction of the patients in Armed Forces hospitals. It is projected that this academic work is expected to recognize the reasons touching patient's satisfaction towards food amenities and thus prospectively to evaluate the degree of satisfaction with food and food amenities of Combined Military Hospital, Bogura. It is expected that the outcomes of the academic work will prime the hospital superintendent for manufacturing complete and suitable recommendation about hospital food amenities to encourage health and wellbeing of the patients.

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Material and Methods

This cross-sectional observational study was carried out at Combined Military Hospital, Savar from August 2024 to October 2024 amongst the admitted patients whose hospital stay were at minimum 24 hours eating and drinking main meals, capable to take food orally, aged 14 years and over in Medicine, Surgery, Gynaecology/ Obs, ENT, Ophthalmology and Orthopedic wards. Total sample

size was 120. Written permission was taken from all participants. Organized questionnaires and agenda were utilized as research instruments. Data were composed through a pretested questionnaire by checklist revising medical papers of the respondents. Questionnaire was organized on reasonable arrangement as per the variables and specific objectives. Composed data were analyzed by statistical package for social sciences (SPSS version 19.0).

Table-I: Distribution of respondents by age, sex, religion, education, marital status, occupation and family status (n=120)

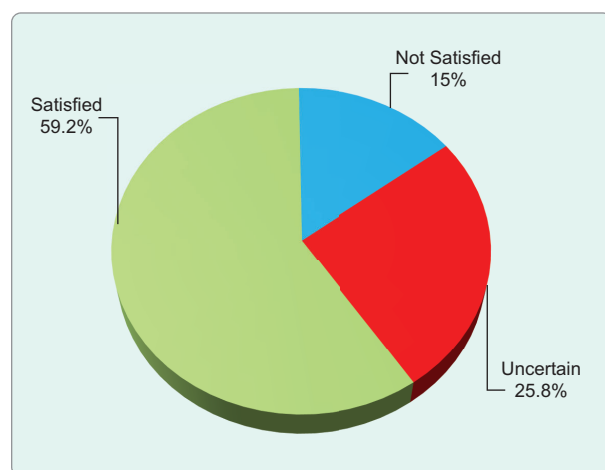
Variables		Frequency (n)	Percentage (%)
Age	14-30	50	41.7
	31-50	36	30.0
	50 and above	34	28.3
Sex	Male	89	74.2
	Female	31	25.8
Religion	Islam	115	95.8
	Hinduism	3	2.5
	Others	2	1.7
Education	Illiterate	7	5.7
	primary	6	5.2
	Secondary	25	20.7
	SSC	29	24.5
	HSC	32	26.3
	Graduation	21	17.7
Marital Status	Married	90	75.1
	Unmarried	27	22.3
	Widow	3	2.6
Occupation	Military Service	59	49.2
	Retired Military	24	20.0
	House Wife	30	25.0
	Student	7	5.8
Family Status	Nuclear	66	55.3
	Join	54	44.7
Hospital Staying	1-7Days	65	54.2
	8-14 days	31	25.5
	>14 Days	24	20.3

Table-II: Patients' satisfaction status in relation to quality of hospital food and food services (n=120)

Variables	Patients Satisfaction		
	Satisfied n (%)	Not Satisfied n (%)	Uncertain n (%)
Tasted of food	45(37.7)	53 (44.3)	22 (18.0)
Amount of food	112 (93.3)	6(5)	2(1.7)
Appearance of food	58 (48.4)	47 (39.4)	15 (12.2)
Variety of food	83 (69.5)	35 (28.8)	2 (1.7)
Warmth of food	103 (85.5)	6 (5.3)	11 (9.2)
Is the food well-cooked?	90 (74.6)	21 (17.6)	9 (7.8)
Time of serving	91 (75.5)	19 (15.8)	10 (8.7)
Cleanliness of utensils	103 (86.1)	6 (4.6)	11 (9.3)
Hygiene of food servers	103 (86)	11 (8.7)	6 (5.3)
Food servers attitude and behavior	102 (85.3)	8 (6.4)	10 (8.3)
Cleanliness of ward/cabin	95 (79.4)	11 (9.2)	14 (11.4)
Taking meal timely	100 (83.6)	9 (7.4)	11 (9)
Taking whole meal	45 (37.5)	56 (46.7)	19 (15.8)
Satisfaction with food warming (micro-oven)	8 (6.7)	90 (75)	22 (18.3)
Satisfaction with food preservation (refrigerator)	10 (8.3)	87 (72.5)	23 (19.2)
Hospital smells stop you from enjoying food	11 (9.2)	102 (85)	7 (5.8)
Option to choose food	2 (1.7)	113 (94.1)	5 (4.2)
Delaying in withdrawal of meal	4 (3.5)	114 (94.8)	2 (1.7)
Rapid withdrawal of meal	6 (5)	112 (93.1)	2 (1.9)
Taking food from own arrangement	66 (54.7)	48 (40.3)	6 (5)
Does this hospital food service better than others	59 (49)	56 (46.7)	5 (4.3)
Overall satisfaction on food of this hospital	71 (59.2)	18 (15)	31 (25.8)

Table-III: Correlation analysis of hospital and food services related variables associated with patient's satisfaction.

variables	r value	P value	Test of Correlation
Tasted of food	0.643	<0.001	Spearman
Food serving Time	0.680	<0.001	
Cleanliness of food server	0.489	<0.001	
Cleanliness of ward/cabin	0.602	<0.001	

**Figure-1:** Distribution of the respondents' satisfaction level (n=120)

Discussion

In this study 59.2% of respondents were satisfied with food and food services which is almost similar to the findings of the study conducted by Sahin et al where it was found 49% of the patients were satisfied to the food and food services in that hospital.⁶ The studies conducted by Abdul Hafez AM et al. and Fernanda GHS et al. had been found similarity with the present study.¹⁷⁻¹⁸ Present study revealed that 37.7% respondents were satisfied with the taste of the food which is similar to the study conducted by Sahin et al.⁶ In this study, 75.5% respondents were satisfied with the food distribution time. This was similar to the study conducted by Abdelhafez AM et al and Sahin et al. In another study conducted by Naithani S et al in India where 35% of the studied patients were not satisfied by the time of food distribution, which was similar to a study conducted by Abdelhafez AM et al.^{6,7,9} As far as the hospitals are concerned food services that satisfy the need

of patients will primarily decrease food wastage and will contribute in making significant savings.¹⁰ Another study conducted by Barton and colleagues found that 40% of the food delivered was not consumed and hospital resources was wastage.¹¹ Whereas in this study only 37.5% respondents consumed the whole meal and 46.7% did not take whole meal and rest 15.8% take whole meal occasional. Personal contact with staff is beneficial because patients perceive emotional support.¹² In this study higher percentage of the patients (85.3%) were satisfied with the attitude and behaviour of food servers. Hospital and Food service satisfaction was strongly correlated with taste of food, food serving time, cleanness of food server and cleanness of ward and cabin ($p < 0.001$) which was similar in a study conducted by Waters et al.¹⁴

Conclusion

The outcome of this academic work recommends that enlightening the taste of food, adjusting food distribution time, improving cleanliness of food server and cleanliness of the ward/cabin result in increased number of satisfied patient with food and food amenities. At the similar period supplementary significant elements touching the satisfaction level of patients should be engaged into contemplation. A specific importance should be specified on appearance, variety, well cooked food, use of head apparatus, mask, apron and hand gloves by food servers and conversation with dietician, clinician and patients on meal assortment. It is expected that the consequence of this academic work would be accommodating in elevating the degree of overall patients, satisfaction with hospital food and food amenities and in indicating the hospital administration in assembling comprehensive and suitable pronouncement regarding hospital food amenities.

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Introduction

The purpose(s) of the study should be clearly stated. Summarize the rationale for the study or observation. Give strictly pertinent references only, and do not review the subject extensively.

Materials and methods

It should include the place of the study, period, the subjects (number and type), the treatment or intervention and the type of statistical analysis.

Results

Present results of your study in logical sequence in the text, tables and illustrations. Do not repeat in the text all data in the tables or illustrations or both. Emphasize or summarize only important observations.

Tables

During preparation of tables following principles should be followed:

- Tables should be simple, self-explanatory and should supplement, not duplicate the text
- Each table should have a title and typed in double space in separate sheet
- They should be numbered consecutively with roman numerical in order of text. Page number should be in the upper right corner
- If abbreviations are to be used, they should be explained in footnotes

Illustration

- All illustration must be numbered consecutively in Arabic numerals as they appear in the text
- Submit print photograph of each illustration along with its electronic file
- Figure number, title of manuscript, name of corresponding author should be written on a sticky label affixed on the back of each photograph

- Scanned picture, graph, chart with title and figure number should be printed on separate page and should be inserted in the CD along with text

Legend

- Must be typed in a separate sheet of paper.
- Photomicrographs should indicate the magnification, internal scale and the method of staining.

Units

- All scientific units should be expressed in System International (SI) units

Discussion

Emphasize the new and important aspects of the study and conclusions that follow from them. Highlight the important/major findings first, then highlight the less-important findings. Do not repeat in detail data or other material given in priority and alluding to work that has not been completed. State new hypotheses when warranted, but clearly label them as such. Recommendations, when appropriate, may be included.

References

The Vancouver system of reference should be used. In the text, reference should be cited using superscripted and numerical. The references should be numbered and listed in order of appearance in the text. Reference to unpublished data and personal communication should not appear in the list but should be cited in the text only (e.g Smith A, 2000, unpublished data). Use 'et al' after three authors where number of authors is more than six.

Acknowledgements

Individuals, organizations or bodies may be acknowledged in the article and may include:

- Name (or a list) of funding bodies.
- Name of the organization(s) and individual(s) with their consent.

Manuscript submission

Manuscript should be submitted to the Executive Editor and must be accompanied by a covering letter and following inclusions:

- A statement regarding the type of article being submitted
- A statement that the work has not been published or submitted for publication elsewhere
- A statement that the manuscript has been read approved and signed by all authors

- A statement of financial or other relationships that might lead to a conflict of interests
- A letter from the head of the institution where the work has been carried out stating that the work has been carried out in that institute and there is no objection to its publication in this journal
- If the article is a whole or part of the dissertation or thesis submitted for degree or fellowship, it should be mentioned in detail and in this case the name of the investigator and guide must be specifically mentioned
- The authors have followed the official secret act. Submissions must be in triplicates with three sets of illustrations

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Disclosure of Contribution of Authors

Corresponding author

As principal investigator Dr

had full access to all of the data in the study and takes responsibility for the integrity of the data and the accuracy of the data analysis.

Study concept and design

Acquisition of data

Analysis and interpretation of data

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Critical revision of the manuscript for important intellectual content

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Administrative, technical, or material support

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