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Contents

Challenges of COVID-19 Pandemic in Nepal

Dr Sujita Shrestha
Chief Editor

The outbreak of highly contagious corona virus was first seen in the Wuhan, China in December 2019. Consequently, the disease has outspread globally with increasing mortality. World Health Organization declared 'Public Health Emergency of International Concern'on 30th January 2020 and a 'pandemic' on 11th March 2020. Nepal, one of the least developing countries with inadequate health infrastructure, human resource and with a very little public health initiative in the health system has been facing the challenges of COVID-19 pandemic. The pandemic has brought a whole set of new challenges in every possible realm.

To prevent and control the pandemic, Nepal like other countries imposed lockdown by provisionally closing down the academic institutions, administrative offices, tourism, financial sector, trading businesses and industries. Besides the disease, the lockdown has resulted in many socio-economic problems. It has restricted the daily activities of the people resulting in interruption of the job and financial crisis. Due to the closure of public transport service, several regular health services have been interrupted or postponed resulting in delayed screening of other health problems which could lead to the chronicity of the disease.

This pandemic has defied the health service and medical practice affecting the healthcare service providers including doctors, health personnel and patients in both public and private sectors. With the worldwide spread of the virus; health institutions or hospitals faced acute scarcity of hospital beds, ICU's, ventilators, medical supplies and health manpower. Medical personnel had to work day and night without proper safety measures, remuneration and extra allowances. They work as the warriors but their challenges do not end at their workplace. For many, they have to reside away from home in a concern that they could transmit the disease to the family members. Still they have to face the social stigma as the carrier of virus and lay people would curse them. Medical personnel were man handled and health facilities were vandalized by some inhumane anti-social behavior which demotivated them to continue their work. Many have lost their own lives trying to save others. The health sector is suffering from economic instability directly or indirectly. Health workers working on COVID-care had to work in low salary or on a daily wage risking their own lives. On the other hand, health personnel of the other discipline were compelled to quit the job or stay on forced-leave.

The situation worsened with the intrusion of second wave of Corona virus with identified double mutant strain in April 2021. The patients suffered brutallyas other challenge started when they found no place in the hospitals due to the lack of beds, ICU's, ventilators, oxygen supply and medications. Many were either denied for hospital admission, or sympathetically adjusted on the hospital floors or corridors. People are compelled to stand in queue with empty cylinders amidst the hot climate or in rain in a hope that their dear ones get the oxygen support and save their life. Many patients breathed their last waiting for the oxygen supply at their homes or on the way wandering to find the hospital bed. Many patients did not visit the hospital as they feared of transmitting the virus. Many patients died despite being provided with the treatment, and many could not afford the high COVID-care costs of the private hospitals. Thus, the people are in panic as well as at higher risk of the infection. It is indeed the situation of battle for life and for the livelihood.

With the new variants of virus and second wave coming relentlessly in neighboring country India and in Nepal; the case fatality and mortality rate is increasing every day. There have been reports of post-COVID syndrome on recovered patients with another health problem like black fungus and psychological disturbances. Due to the pandemic, the human race is currently undergoing a period of jeopardy and uncertainty. In Nepal, the biggest present challenge is the inadequate supply of medical facility and vaccination against the corona virus across the country.

The COVID-19 pandemic caused severe impact on medical education as universities and medical/dental colleges were closed in response to the lockdown laid down by the government. Though real classes were replaced by the online sessions, the required skill and practical knowledge could not be imparted properly to the learners and evaluation system was weakened. As the medical education is the integration of informative session with clinical trainings; the clinical exposure, patient interaction and communication skill were restricted due to the pandemic. In such situation, medical students who are the future medical personnel had limited clinical knowledge, skill and attitude towards the patient care. It has extremely reduced the teaching/learning activities, continuous supervision and feedback from the teachers.Though the universities, faculties as well as students have been trying to manage the present critical time; the long-term effect on medical education and career of the future doctor/health workers are still uncertain.

A ray of hope is seen after the invention of vaccine against COVID-19 in the late 2020's. Studies have shown that the risk of developing a symptomatic infection was less and it also reduced the chances of transmission of the corona virus compared to unvaccinated individuals. Even if they had infection the severity of the disease condition was less. Enough data and significant adverse effect has not been reported against COVID vaccine till date. The countries with high income are getting vaccines as earliest; however equitable allocations of vaccines are required to all the people of all countries to be free from the disease of COVID-19 pandemic. Many pharmaceutical companies are working on improving the manufacture capacity to fulfill the worldwide demand of the vaccine with safe and effective results. Safe and effective vaccines can prevent from the disease but simple measures like wearing masks, cleaning hands, ensuring good indoor ventilation, physical distancing and avoiding crowds should be continued as the real solution to combat COVID-19 disease.

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Effect of Facemask on Oxygen Saturation and Respiratory Rate among Young Adults

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ABSTRACT

Introduction: With the recent COVID-19 outbreak as well as the increase in infectious disease and pollution in the air have led to the routine use of facemask by health care workers as well as general population. Many individuals felt shortness of breathing wearing facemask while performing common works such as climbing stairs; which is the base for our study.

Objective: To observe respiratory changes with and without the use of facemask

Materials and Method: An experimental study using purposive sampling on young, healthy dental students and staffs was conducted at Kantipur Dental College, Kathmandu, Nepal. Oxygen saturation and respiratory rate with and without wearing facemask at the ground floor and top floor was measured and correlated among 44 participants. Equal number of male and female were taken.

Result: The result showed significant difference in respiratory rate with and without wearing facemask (respiratory rate: 20.14 ± 3.24 vs 18.98 ± 2.57, respectively $p<0.05$). Similarly, difference in SpO_2 at top floor with and without the use of facemask (SpO_2: 92.95±3.15 vs 95.14±2.27) was found to be significant ($p< 0.05$). Also, it was observed that the SpO_2 in male and female without wearing facemask and with facemask at the top floor (SpO_2: 94.41± 2.30 vs 92.18 ± 2.15 in male and 95.86 ± 2.03 vs 93.73 ± 3.80 in female) was significant ($p < 0.05$) in both cases. However, only female showed increase in respiratory rate at top floor without and with the use of facemask (respiratory rate: 27.27 ± 3.68 vs 28.55 ± 3.62) significantly at $p<0.05$.

Conclusion: Although, the study showed significant change in respiratory parameter with the use of facemask at performing certain level of work, an extensive study is required to observe immediate and long-term change in respiratory parameters with the use of facemasks.

Keywords: COVID-19, facemask, oxygen saturation, respiratory rate.

INTRODUCTION

The use of facemask, whether it's Severe Acute Respiratory Syndrome (SARS) pandemic in 2003, H7N9 influenza outbreaks or the recent coronavirus disease 2019 (COVID-19) pandemic, has been recommended to use for prevention and transmission of the disease to the health care workers as well as general population of all age and gender.[1-3] The use of facemask is one of the best, cost-efficient preventive measure for prevention from the air borne diseases.

N95 facemasks have been recommended for the use in prevention of such diseases as they meet filtration requirements of small airborne particles, fit tightly to the wearer's face and have been suggested to be more efficacious than surgical masks in reducing exposure to viral infections.[4] The use of facemask is very common today concerning the pandemic spread of corona virus as people wearing facemask can be seen everywhere doing regular as well as strenuous work, as it is advised by the World Health Organization (WHO) that the use of facemask reduces the transmission of the virus through the droplets.

Very few studies have been conducted regarding the physiological impact with the use of facemasks on the respiratory function. The use of facemask has been

associated with labored breathing in various studies.[5,6] Many individuals find trouble breathing while performing common task more than usual with the use of facemask. As the quantitative effect of facemask on respiratory parameters have not been systematically reported, the present study aims to determine the correlation between respiratory changes with and without using facemask.

MATERIALS AND METHOD

An experimental study was conducted at Kantipur Dental College Hospital and Research Centre, Kathmandu. Young healthy volunteers (dental students, interns and staffs), aged range from 19-35 years old were included for the study. Participants with cardiovascular, respiratory, musculoskeletal disorders and other medical contradictions were excluded. The ethical clearance was obtained from the Institutional Review Committee (IRC) of KDCH before conducting the study. A non-probability purposive sampling technique was used and informed consent was taken from the participants prior to data collection.

All the participants were provided with KN95 facemask which fits tightly to the wearer's face. KN95 have been suggested to be more efficacious than surgical masks in reducing exposure to viral infections and can also protect against airborne particles like pollutants and allergens. It ensures a particle filtering efficiency of at least 95% of non-oily suspended particles of 0.3 microns or larger.

The study was conducted in 2 phases: without wearing facemask and wearing a KN95 facemask and data was collected at the ground floor and top (5^{th}) floor. During the first phase (without wearing facemask), the participants were rested for 5 minutes and respiratory rate and oxygen saturation were taken at the ground floor. Then the participants were asked to climb the stairs at a brisk but even pace for 5^{th} floors.[7-9] Immediately after the participants reached the top (5^{th}) floor respiratory rate and oxygen saturation were taken again.

In the second phase (wearing a KN95 facemask) the participants were asked to wear KN95 facemask and were rested for 5 minutes for conditioning the participants and after 5 minutes respiratory rate and oxygen saturation was taken. The participants were then asked to climb the stairs wearing the facemask again at a brisk but even pace and the data were collected at the top floor.

The sample size was calculated using the formula from mean and standard deviation,[5]

$$n = 2(z\alpha + z\beta)^2 \times (SD_1^2 + SD_2^2) / (M_1 - M_2)^2$$

$$= 2\{2.8^2 \times (7.1^2 + 6.3^2)\} / (27.7 - 21.7)^2$$

$$= 2(7.84 \times 90.1)/ 36$$

$$= 2(19.622)$$

$$= 40$$

Considering for a 10% chance of error or outliers, the calculated sample size is

$$n = 40 + 10\% \text{ of } 40$$

$$= 44$$

Thus, 22 males and 22 females were taken.

Collected data was organized, recorded, coded and analyzed using Microsoft Excel and Statistical Package of Social Science (SPSS) version 1.6. Paired t-test was used to compare mean and standard deviation between respiratory variables without and with facemask and independent sample t-test was done to compare changes in male and female without and while using facemask at 95% level of significance.

RESULT

At the ground floor; prior to stair climbing, the mean oxygen saturation with and without wearing facemask was found to be statistically insignificant ($p=0.623$), whereas average respiratory rate without the use of facemask and with the use of facemask was found to be statistically significant ($p=0.048$) as depicted in Table 1. However, after stair climbing at the top floor, the mean oxygen saturation with the use of facemask was found to be statistically significant ($p<0.001$) whereas, there was no significant difference observed in respiratory rate (Table 2). Difference in SpO_2 and respiratory rate at the ground floor with and without facemask was found to be not significant within the gender groups (Table 3 and Table 4).

As shown in Table 5, SpO_2 after stair climbing at top floor without and with facemask among gender was found to be statistically significant among both genders ($p<0.001$). Respiratory rate difference after stair climbing at top floor without and with facemask was statistically significant among female ($p=0.007$) and statistically not significant among male ($p=0.728$) depicted in Table 6. Mean difference of respiratory rate at top floor without and with facemask among gender was statistically significant ($p=0.035$) as shown in Table 7.

Table 1: Comparison of SpO_2 and respiratory rate (RR) at ground floor with and without facemask

Parameter		Mean	Std. Deviation	*p* Value
SpO_2	Ground floor with facemask	97.15	0.96	0.623
	Ground floor without facemask	97.02	1.56	
Respiratory rate	Ground floor with facemask	20.13	3.23	0.048*
	Ground floor without facemask	18.97	2.57	

*p Value <0.05

Table 2: Comparison of SpO_2 and respiratory rate at top floor after stair climbing with and without facemask

Parameter		Mean	Std. Deviation	*p* Value
SpO_2	Top floor with facemask	92.95	3.15	0.000006*
	Top floor without facemask	95.13	2.26	
Respiratory rate	Top floor with facemask	26.36	4.28	0.124
	Top floor without facemask	25.81	3.86	

Table 3: Comparison of $Sp0_2$ at ground floor without and with facemask among gender

Sample	Sample size(n)	SpO_2				*p* Value
		Without facemask		With facemask		
		Mean	S.D.	Mean	S.D.	
Male	22	96.68	1.67	96.72	0.98	0.918
Female	22	97.36	1.39	97.59	0.73	0.520

Table 4: Comparison of respiratory rate at ground floor without and with facemask among gender

Sample	Sample size(n)	Respiratory rate				*p* Value
		Without facemask		With facemask		
		Mean	S.D.	Mean	S.D.	
Male	22	18.81	1.94	19.45	3.11	0.357
Female	22	19.13	3.12	20.81	3.27	0.082

Table 5: Comparison of $Sp0_2$ after stair climbing at top floor without and with facemask among gender

Sample	Sample size(n)	SpO_2				*p* Value
		Without facemask		With facemask		
		Mean	S.D.	Mean	S.D.	
Male	22	94.40	2.30	92.18	2.15	0.000223*
Female	22	95.86	2.03	93.72	3.81	0.005527*

Table 6: Comparison of respiratory rate after stair climbing at top floor without and with facemask among gender

Sample	Sample size(n)	Respiratory rate				*p* Value
		Without facemask		With facemask		
		Mean	S.D.	Mean	S.D.	
Male	22	24.36	3.55	24.18	3.80	0.728
Female	22	27.27	3.67	28.54	3.62	0.007*

Table 7: Comparison of mean difference of respiratory variables without and with facemask among gender

Gender	SpO_2 at ground floor		RR at ground floor		SpO_2 at top floor		RR at top floor	
	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.
Male	0.05	2.03	0.64	3.17	2.23	2.34	0.18	2.42
Female	0.23	1.63	1.68	4.31	2.14	3.24	1.27	1.98
p value	0.745		0.365		0.916		0.035*	

DISCUSSION

The present study showed significant difference in the respiratory parameters with and without the use of facemask which is also supported by various other studies.[3,7] The study showed that there is a statistically significant (p=0.048) increment in mean respiratory rate with the use of mask at the ground floor as opposed to other studies.[8] This may be because of the fact that wearing facemask (KN95) that are similar to N95 facemask increases the external dead volume and the inhaled air consists of greater proportion of carbon dioxide (CO_2) and is a potent respiratory stimulant.[9] The mean SpO_2 at the top floor after stair climbing was found to be lower while wearing the facemask as compared to without wearing facemask and statistical significance which is similar to the study reported by Kao TW[10] whereas few studies showed no significant effect on mean SpO_2 at low energy expenditure activities.[5,11] The mean SpO_2 within male and female was also found to be significant with the use of facemask at the top floor which is consistent with the overall sample population. However, mean respiratory rate of female population was found to be significant and higher with the use of facemask and after stair climbing as opposed to male population where there is no significant change. Also, mean difference of respiratory rate with and without the use of facemask among male and female was found to be significant.

CONCLUSION

The study showed significant change in respiratory parameter with the use of facemask at performing certain level of work, an extensive study is required to observe immediate and long-term change in respiratory parameters with the use of facemasks. It is also recommended not to use facemask while doing long strenuous work as it may markedly decrease saturation of oxygen which may exacerbate other cardiorespiratory disorders.

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Conflict of interest: None

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Knowledge and Practice of Preventive Behavior on COVID-19 among School-children of Kathmandu Valley

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ABSTRACT

Introduction: Corona virus disease 2019 (COVID-19) is highly contagious fastest spreading viral disease with asymptomatic carriers. Occurrence of Corona virus infection is less in children and adolescents as compared to adults. Transmission of the disease can be prevented by practicing strict preventive measures. The objective of the study was to assess the knowledge and practice of preventive behavior regarding COVID-19 among school-children of Kathmandu valley.

Materials & Method: A cross-sectional questionnaire-based study was conducted on 468 school-children of Kathmandu valley from June-September 2020, using convenience sampling technique. Ethical clearance was obtained from the Institutional Review Committee of Kantipur Dental College. Self-administered online questionnaire survey was done among the children aged 10-15 years. Data was retrieved and entered into Microsoft Excel spreadsheet and descriptive analysis was done.

Result: Among 468 participants; 245 (52.4%) were male and 223 (47.6%) were female. Most of the school-children (98.5%) knew that hand washing, covering the nose and mouth while coughing, and avoiding contacts with infected people can prevent transmission of COVID-19 infection. Only 50% of the school-children washed their hands with soap and water more than usual, 93% wore mouth mask when going outside and 70.9% school-children avoided hand shaking and hugging friends and family during this pandemic period.

Conclusion: Most of the students in Kathmandu valley are aware about the signs and symptoms, mode of transmission about COVID-19 and possess appropriate preventive behavior. The government and educational authorities can improve students' behaviors by health education and help in control of disease transmission.

Keywords: COVID-19; knowledge; preventive behavior; school-children

INTRODUCTION

Corona virus disease 2019 (COVID-19) was declared a pandemic by World Health Organization in March 2020.[1] COVID-19 is fastest spreading viral infection because it is highly contagious in nature and asymptomatic carriers, therefore individual of all age groups are at risk.[1-3] COVID -19 infections in children and adolescents are less compared to adults and older people.[4] A healthy respiratory system, active immune system and presence of few co-morbidities in children may have reduced infection. Most of the children who got infected have mild symptoms or asymptomatic but still can spread the COVID-19 infection to others.[5]

Proper knowledge and positive attitudes can be influencing factors for formation of better preventive behaviors.[6] The preventive measures include hand washing, use of personal protective equipment and minimization of hand-to-face contact.[7,8] Practice of preventive measures potentially prevents from acquiring disease and reduces disease transmission.[6-9]

Children can be important cohort to help communities, friends and families to control spread of virus from susceptible group by practicing preventive measures.[4] Thus, the study aims to assess knowledge and practice of preventive behavior regarding COVID-19 among school-children of Kathmandu valley.

MATERIALS & METHOD

A cross-sectional, questionnaire based study was conducted among 10-15 years old school-children of Kathmandu valley. Convenience sampling technique was used. Sample size was calculated by using the following formula:

$$n = \frac{Z^2 \times p \times q}{e^2}$$

where, n = sample size, p= prevalence of knowledge was

60 % from the study by Asraf et al.[10] q= 1-p i.e. 40% e= margin of error i.e. 5%. A non-response rate of 20% was added and thus, the estimated sample size was 442. A total of 468 school-children participated in the study. Data collection was done during July-September 2020 after obtaining the ethical approval from Institutional Review Committee- Kantipur Dental College (Ref No 18/020). Recently due to COVID-19 pandemic; classes are being conducted to students via Zoom/Messenger as a part of distance learning. Students who were attending e-class and using social media and willing to participate were included in the study. Exclusion criteria included; school-children not using social media and those who did not give consent for the study.

The questionnaire was developed from the study done by Taghrir et al.[11] with some minor revisions and few additional questions. It was validated among 45 school-children which was not included in the analysis. The questionnaire consisted of three sections. The first section comprised of demographic data, second section had 10 questions about knowledge in 3-likert scale (Yes, No, Don't know), and third section included 7 questions about preventive behavior in 4-likert scale (Always, Most of the time, Sometime, Not at all) regarding COVID-19.

Data collection was done using self-administered online survey questionnaire developed on Google form and distribution was done through social media. Email addresses of the selected school-children were obtained with the permission from the school principal. Brief information about the objective of study was included in the questionnaire, and the children who agreed to participate could move further. Data was retrieved from the online survey, entered into Microsoft Excel spreadsheet and descriptive analysis was performed.

RESULT

Among 468 participants, 245 (52.4%) were male and 223 (47.6%) were female. Among the school-children; 42 (9%) were 10 years, 65 (13.9%) 11 years, 68 (14.5%) 12 years, 77 (16.5%) 13 years, 93 (19.9%) 14 years and 123 (26.3%) were 15 years old.

Most of the school-children 98.7% knew that hand washing, covering nose and mouth while coughing, and avoiding contacts with sick people can prevent transmission of COVID-19 infection (Table 1). 50% of school-children washed their hands with soap and water more than usual and 93.6 % wore mask while going outside. 82.7% of school-children have not gone outside to play with friends during this period and 6.6 % always goes outside to play with friends (Table 2).

Table 1: Knowledge regarding Covid-19

S.N	Knowledge	Yes N (%)	No N (%)	Don't Know N (%)
1.	COVID-19 is a respiratory infection caused by a new species of corona virus family	353(75.4)	41(8.8)	74(15.8)
2.	The origin of COVID-19 is not clear, but believed that it has been transmitted to human by sea foods, or bats.	378(80.8)	32(6.8)	58(12.4)
3.	COVID-19 common symptoms are fever, cough and shortness of breath	457(97.6)	3(0.6)	8(1.7)
4.	Vomiting and Diarrhea is NOT common symptom of COVID-19	104(22.2)	262(56)	102(21.8)
5.	Do you know incubation period disease of COVID-19	186(39.7)	140(29.9)	142(30.3)
6.	Have you heard about isolation and quarantine	461(98.5)	5(1.1)	2(0.4)
7.	COVID-19 is transmitted through respiratory droplets such as cough and sneeze	443(94.7)	7(1.5)	18(3.9)
8.	Hand washing, covering nose and mouth while coughing, and avoiding contacts with sick people can help in the prevention of COVID-19 transmission	462(98.7)	4(0.9)	2(0.4)
9.	A mouth mask is useful to prevent the spread of respiratory droplets during coughing	436(93.2)	9(1.9)	23(4.9)
10.	The disease can be treated by usual medicine	50(10.7)	322(68.8)	96(20.5)

Table 2: Preventive Behavior on COVID-19

S.N	Preventive Behavior	Always N (%)	Most of the time N (%)	Sometime N (%)	Not at all N (%)
11.	Wash my hands with soap and water more often than usual	235(50.2)	205(43.8)	28(6.0)	-
12.	Follow the hand-washing technique	285(60.9)	129(27.6)	52(11.1)	2(0.4)
13.	Wear mask while going outside of home	438(93.6)	24(5.1)	3(0.6)	3(0.6)
14.	Go out to play with friends	31(6.6)	15(3.2)	81(17.3)	341(82.7)
15.	Cover my mouth or use handkerchief while coughing and sneezing	344(73.5)	92(19.7)	30(6.4)	2(0.4)
16.	Avoid hand shaking or hugging friends/family during this period	332(70.9)	71(15.2)	33(7.1)	32(6.8)
17.	Discuss COVID-19 prevention methods with my family and friends	151(32.3)	166(35.5)	130(27.8)	21(4.5)

DISCUSSION

In the present study, we assessed knowledge and practice of preventive behavior regarding COVID-19 among school-children of Kathmandu valley. Corona virus disease 2019 (COVID-19) is an infectious disease caused by a single stranded non-segmented RNA viruses (CoVs) belonging to the Nidovirales order of the Coronaviridae family that are positive-sense.[2,3] The mode of spread of virus is by droplets or by direct contact with infected person.[5-9] The current study found that over 75% of school-children knew that COVID-19 is a respiratory infectious disease, and 97.6% knew that fever, cough and shortness of breath were common symptoms of COVID-19.The majority of students reported fever, cough and nasal congestion as clinical symptoms similar to Souli et al,[12] Wen et al[9] studies and among Combodian[13] children. The findings were consistent with other studies done on health workers,[14-16] and general population.[17,18] Present study found that 94.7% agreed that COVID-19 is transmitted through respiratory droplets (cough and sneeze) and majority (98.7%) of students agreed on the importance of hand washing, covering nose and mouth while coughing, and avoiding contacts with sick people can help in the prevention of COVID-19 transmission. Many students (93.2%) reported that infection can be prevented with the use of mouth-mask. Similar studies done by many researchers have same opinion regarding mode of transmission.[5,8-18]

In this COVID-19 pandemic, importance of face mask for the prevention of infection had been stated by World Health Organization (WHO) and was also endorsed in the national guidelines of various countries.[8] The present study reported that 93.6% children wore face mask when going outside. The effectiveness of face mask in reducing the virus transmission from person-to-person has been confirmed by many studies.[8-18]

Study found that 50.2% of children always washed hands with soap and water more often than usual. Studies have proven that maintaining hand hygiene and washing hand with soap water for 20 seconds or use of alcohol based sanitizers can prevent or minimize virus transmission significantly.[6,9] Hand washing is the most frequently reported method of protection against virus transmission among school-children, health personal and general population.[5,9-18]

The droplets released while sneezing or coughing from infected person can transmit the infection and present study reported that 73.5% children always covered mouth or used handkerchief while coughing and sneezing. Majority of researchers have agreed on the importance of social distancing in prevention or minimizing transmission of COVID-19 infection.[9-18] In present study 70.9% school-children have avoided hand shaking or hugging friends and family during this period. Although the results are consistent with previous studies done on Covid-19, approximately 14% were not maintaining social distance among friends/family members and 6.6% goes out to play with friends which can be a source of virus transmission.

The study has found that the majority school-children of Kathmandu valley have knowledge about sign and symptoms, mode of virus transmission regarding COVID-19 and practicing good preventive behaviors. The reason for practicing preventive behaviors and have knowledge could be accessibility to various sources of information. This study was done after WHO has declared COVID-19 as a global pandemic and had started to show its effects in Nepal. Children could gather information on COVID-19 from internet, television, radio, ring tones of phone and discussion among teachers/family/friends etc.

The study has some limitations; school-children that are attending e-class or using social media, so the accuracy of the data cannot be assured as it had been collected through an online. The level of education and information delivery network might be higher than in general as the study was done among Kathmandu valley school-children therefore, the results cannot be generalized. Knowledge, attitude and practice survey regarding COVID-19 should be conducted among large sample including government schools.

CONCLUSION

Most of the students in Kathmandu valley knew about the sign and symptoms, mode of transmission of virus about COVID-19 and have appropriate preventive behavior. Improvement in preventive behavior towards ongoing COVID-19 pandemic can help to prevent disease transmission. The government and education authorities can improve students' behaviors by health education and help in controlling the disease transmission.

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Attitude and Perception of Undergraduate Dental Students towards Curriculum

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ABSTRACT

Introduction: The career choices in countries like Nepal are growing in a diverse way; however medical field still remains the first choice for many students. The curriculum of any subject is a dynamic process with periodic changes. Need assessment from academicians and stakeholders with proper planning is needed. There are several methods to evaluate the curriculum; one of the important way is to take the students' perspective and opinion. The objective of the study was to assess the attitude and perception of dental students towards their curriculum.

Materials & Method: A cross-sectional study was carried out among 125 interns of various dental colleges of Kathmandu. Data was collected using pre-designed, closed-ended questionnaire. The objective and scope of the study was personally explained to the participants. The data analysis was done using SPSS Version 21. Descriptive analysis and chi square test was done at a significant level of $p<0.05$.

Result: Out of a total 125 participants, 41.6% agreed that they enjoyed the theory lectures and methods of learning, 55.2% agreed that they were satisfied with the overall BDS program. 84% felt that the number of theory classes were adequate, 70.4% felt that the number of clinical sessions were adequate and 76% felt that the number of patients to whom they provided treatment was adequate. 60% agreed that at least one faculty motivated them to pursue their future aspirations in dentistry.

Conclusion: Majority of the students showed a positive attitude towards their curriculum with some concerns regarding their existing curriculum. Newer education model including the problem solving and critical evaluation skills should be encouraged.

Keywords: attitude, curriculum, dental students, perception

INTRODUCTION

The students today have diverse choices for their career in Nepal; even then medical field remains the first choice of many students. There are various factors that influence the career choices of these influences, ranging from parental influence and their peers.[1,2] Also, dental human resource play an important role in the field of health care.[3] Similar to other fields of education, the curriculum of medicine/ dentistry need periodic changes. The curriculum which is not flexible tends to remain static whereas a dynamic curriculum fulfils the academic needs of students, community and the profession.[4]

Need assessment from learners and academicians with proper planning is required.[5] There are several methods to evaluate the curriculum; one of the important way is to take the students' perspective and opinion.[6,7] However, this important aspect has been less researched in many dental colleges in Nepal. Dental colleges might have been taking feedbacks from their students on a regular basis however, a summative evaluation on the dental curriculum and educational activities from the view point of students who have completed the course of their studies, are yet to be carried out. Therefore, our study was conducted to assess the attitude and perception of dental students towards their teaching and learning activities.

MATERIALS AND METHOD

A cross-sectional pilot study was carried out among 15 undergraduate students who were nearing the completion of BDS curriculum in Kantipur Dental College.The domains of questionnaire used included student opinions on learning experience in undergraduate curriculum, components of teaching and student motivation and support services. The value of Cronbach's alpha was calculated to be 0.65.

A total of 18 closed ended questions adopted from study by Shetty et al.[4] and referred to literature like Association of American Medical College's 2000 graduation questionnaire and the Dundee Ready Education Environment (DREEM) inventory to refine the question.

The final questionnaire was given after making necessary modifications for contents and comprehension by three faculty members. The answers were recorded under three-point Likert scale. The Dental colleges selected by simple random sampling method. Dental interns were taken as the study population. Those interns who gave consent and were present at the time of study were included in the study. The study duration was 3 months.

The objective and scope of the study was explained to all the participants prior to the study. Data collection was done by personally distributing the questionnaires to the participants.Ethical approval obtained from Institutional Review Committee of Kantipur Dental College and prior permission obtained from the concerned authorities of the dental colleges. Data was collected from four dental colleges, Kantipur Dental College Teaching Hospital and Research Center, People's Dental College, Kathmandu University School of Medical Sciences and Nepal Medical College. The responses were coded and data entry was done in Microsoft Excel. Data analysis was done using Statistical Package for Social Sciences version 21.

RESULT

The questionnaire was distributed to 132 participants in four different colleges, out of which 125 of them returned the fully filled proformas. Therefore, the response rate was calculated to be 94.69%. The age range of study participants was from 22 to 27 years, with mean age being 23.87 years. Among the total participants, 20% were males and 80% of them were females. The participants who resided in their homes were 62.4% and 37.6% lived in the hostels. Regarding the funding source for their education, 113 i.e. 90.4% had financed for their education on their own and 12 i.e. 9.6% were scholarship students.

Regarding the perception on components of learning experience in undergraduate curriculum, mean score among males and females was 2.47 and 2.52 respectively. Based on funding source, mean score of self-finance students was found to be 2.54 and that of scholarship students was 2.16. Based on residence, mean score of hostel students was found to be 2.56 and those residing at home was 2.07. Mann Whitney test showed statistically significant difference in funding source (p value 0.034) and no statistically significant difference was found between gender (p value 0.645) and residence (p value 0.453).

Regarding perceptions of teaching learning program, mean score of males was 1.89 and that of female was 1.77, for self-finance students it was found to be 1.79 and scholarship students was 1.80. Mean score of students residing in hostel was 1.77 and for those residing in home was 1.81. Mann Whitney test reported statistically significant difference between gender (p value 0.002) and not between funding source (p value 0.791) and residence (p value 0.571).

Regarding perceptions on support and faculty members, mean score of males was found to be 2.52 and that of female was 2.50, for self-finance students mean score was 2.50 and for scholarship students it was found to be 2.51, for students residing in hostel mean score was 2.48 and for

Table 1: Perception of students on components of learning experience in the undergraduate curriculum

Questions	Agree (%)	Neutral (%)	Disagree (%)
Basic sciences training prepared me adequately for clinical practice	60.8	24.0	15.2
Adequate clinical training under supervision of faculty	62.4	23.2	14.4
Learnt in the theory lectures and enjoyed method of teaching	41.6	40	18.4
Internship necessary for BDS for consolidating learning	96.8	2.4	0.8
Satisfied with my overall BDS training	55.2	32	12.8

Table 2: Perception of students on components of teaching-learning program

Questions	Inadequate (%)	Appropriate (%)	Excessive (%)
Number of theory classes	12.8	84	3.2
Duration of theory classes	1.6	79.2	19.2
Number of patients treated	20	76	4
Number of patients examined	24.8	71.2	4
Number of clinical sessions	28.8	70.4	0.8
Duration of clinical sessions	26.4	69.6	4.0
Amount of clinical materials provided	61.6	37.6	0.8

Table 3: Perception of students on support and faculty members

Questions	Agree (%)	Neutral (%)	Disagree (%)
Received personal counseling from faculty members when sought	56.0	20.8	23.2
Received adequate encouragement when my performance was not up to the mark	51.2	23.2	25.6
Found at least one faculty whom I consider to be a good dentist	84	12	4
Found at least one faculty whom I consider to be a good teacher	77.6	14.4	8.0
At least one faculty member highly motivated me for pursuing my future aspirations in dentistry	60	24	16

those residing in home was 2.51. Statistically significant difference was not found between the mean score and gender (p value 0.467), funding source (p value 0.588) and residence (p value 0.606).

DISCUSSION

The attitudes and perceptions of the students who are graduating, regarding the curriculum, motivation and support system is very important. The results of the questionnaire showed a different dimension of the teaching and learning experience in the institution.

Regarding components of learning experience in undergraduate curriculum, study by Shetty et al showed positive response similar to our study; however the percentage was higher among their students. 93.3% of them agreed that they have received adequate basic science training that prepared them for clinical practice whereas in our study only 60.8% agreed regarding the same. In our study 62.4% agreed that they had adequate clinical training under personal supervision, whereas in Shetty study 84.4% agreed to the same. In our study only 41.6% agreed that they learnt in theory lectures and enjoyed the method of teaching, while in the study by Shetty et al 72.7% agreed to the same. 95.6% of the students were satisfied with their overall BDS training while only 55.2% of our study participants were satisfied with their BDS training.

Regarding components of teaching learning program, results showed that majority of students in our study as well as in Shetty et al study, found the number of theory classes, duration of theory classes, number of patients treated, number of patients examined, number of clinical sessions and duration of clinical sessions to be appropriate. However, majority of the students in our study i.e. 61.6% responded that the amount clinical materials provided to them was inadequate whereas it was only 4.5% in the study by Shetty et al.

Also, regarding opinions about support and faculty members, majority of the students showed positive response in both the studies however, percentage is lesser in our study. 81.4% of the students in the study by Shetty et al agreed to have received adequate personal counseling from faculty members when sought, whereas it was only 56% in our study. 65.9% agreed to have received encouragement from teachers when their performance was not up to the mark while it was only 51.2% in our study. 88.9% agreed that at least one faculty member highly motivated them to pursue their future aspirations while it was only 60% in our study. Study by Murphy et al showed that the dental students prefer attending their lecture classes and prefer visual presentations by instructors to augment their verbal presentations and facilitate note-writing during class with notes and handouts.

CONCLUSION

The study has identified the strengths of the current curriculum like the approval of current teaching programs and student motivation and support. However, some areas that were of concern include infrastructure facilities and clinical resources. There is still the need to make some changes in the curricular activities of the dental students in Nepal. Clinical seminars, case presentations, journal discussions, inter departmental activities and comprehensive treatment planning sessions have to be included into the undergraduate curriculum. Analytical and logical reasoning skills should take the front seat in the dental course in Nepal. The students will not only be benefitted, but their attitude toward dentistry and health care is sure to change

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Prediction of Dental Arch Perimeter based on Inter-canine and Inter-molar Width

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ABSTRACT

Introduction: Arch perimeter (AP), inter-canine width (ICW) and inter-molar width (IMW) are closely related factors essential for diagnosis in Orthodontics. Prediction of the change in arch perimeter as a consequence of transverse expansion could be helpful in orthodontic treatment planning.

Objective: To determine the relationship between AP, ICW and IMW in Angle's Class I molar relation.

Materials and Method: This study was done using 124 study models meeting the inclusion criteria collected from pre-treatment records of Department of Orthodontics, Kantipur Dental College. Measurements of arch perimeter, inter-canine width and inter-molar width were done by a single observer with the help of digital Vernier caliper. Correlation between these variables was determined using Pearson's correlation coefficient in upper and lower arches respectively. Linear regression analysis was applied between the correlated variables.

Result: The data showed moderate correlations between ICW-AP and IMW-AP for lower arch (r = 0.494 and 0.637 respectively) and ICW-AP (r= 0.477) for upper arch.

Conclusion: The regression equations for the prediction of arch perimeter have been established for upper and lower arches for Nepali sample. The values of inter-canine width and inter-molar width will help to predict the value of arch perimeter and vice-versa.

Keywords: Arch perimeter; correlation; inter-canine width; inter-molar width

INTRODUCTION

Knowledge regarding dental arch dimensions is of great significance to clinical dentistry as well as to other sciences such as anthropology, anatomy and forensic odontology.[1] Growth and treatment related changesthat occur in the dental arch dimensions are of interest to the orthodontists. Arch perimeter (AP), inter-canine width (ICW) and inter-molar width (IMW) are essential for diagnosis and treatment planning and are closely inter-related factors.[2] A better understanding of the changes in inter-canine width, inter-molar width and arch perimeter can influence the treatment plan and retention protocols by the clinician.[3]

Arch perimeter is regarded as one of the most vital dental arch parameters and is defined as the distance from the mesial surface of the first permanent molar around the dental arch to the same point in the opposite side.[4]

Arch perimeter can be measured using several methods. These include:

1. Direct measurement by use of a brass or steel wire[5]
2. Using a segmented arch technique to be calculated on a study cast[6]
3. Using a special device called a catenometer[7]
4. Use of sonic dental cast digitization[8] and
5. Computing the arch perimeter by mathematical method via different equations and functions.[9-11]

As per Ricketts et al (1982), for each one-millimeter increase of inter-canine and inter-molar width, the arch length (AL) increased by 1 mm and 0.25 mm, respectively.[12] Adkins et al (1990) showed that rapid palatal expansion with a Hyrax appliance produced an increase in the maxillary arch perimeter of approximately 0.7 mm.[13] Germane et al (1991) found that incisor advancement was responsible for the greatest increase in arch perimeter for each millimeter of expansion, followed by canine expansion and molar expansion.[14] Motoyoshi et al (2002) showedan increase in arch perimeter of 0.37 mm by 1 mm increase in inter-molar width.[15]

The aim of the present study was to determine the relationship between AP, ICW and IMW in Angle's Class I molar relation.

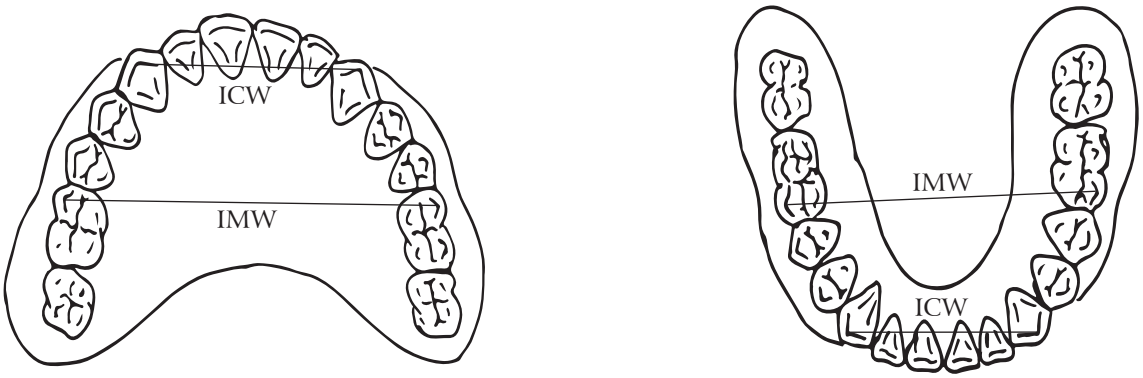

Figure 1: Arch widths measurement in maxillary and mandibular arches (Picture source: Dhakal J et al. Evaluation of dental arch widths in different malocclusion groups)[w]

MATERIALS AND METHOD

The upper and lower dental casts of patient having Angle's Class I molar relation visiting Department of Orthodontics, Kantipur Dental College were selected.

The sample size was calculated using the data from the study of Acharya et al[16] using following formula,

$$\text{Sample Size (n)} = \frac{\frac{Z^2pq}{e^2}}{1+\frac{Z^2pq}{e^2N}}$$

Where, z = z deviate corresponding to desired reliability level (at 95%, 1.96), p = 63.33%, q = (100 – p) = 100 – 63.33 = 36.67%, with margin of error (e) = 0.05 (5%) and N= Number of patient visiting the department with Angle's Class I molar relation in a period of 6 months = 150.

Total number of sample was 124 including 62 male and 62 female patients.

The inclusion criteria were: pre-treatment study cast of patients aged between 13-30 years with Angle's Class I molar relation; with full complement of permanent dentition from first molar of one side to the other; fully erupted first molars without the gingiva overlapping the distal surface of the teeth. Poor quality study model with missing or malformed permanent first molars; teeth with large restorations or teeth with abnormal shapes that could change the mesiodistal diameter of the tooth were excluded.

The measurements of inter-molar width, inter-canine width were performed by a single observer (Principal Investigator) using digital Vernier caliper up to the nearest of 0.01 mm according to Burris and Harris method (Figure 1).[17]

Inter-canine width (ICW): Distance between cusp/incisal tips of canine or estimated cusp tips in cases of wear facets.

Inter-molar width (IMW): Distance between mesiobuccal cusp tips of first molar or estimated cusp tips in cases of wear facets.

Arch perimeter (AP): Measurement from the mesial of the first molar to the mesial of the first molar of the opposite side.

According to Adkins et al, arch perimeter is the sum of the lengths of the segments connecting points 2, 4, 6, 8, 10, and 12 (Figure 2).[13]

The Statistical Package for Social Sciences (SPSS Inc., V.21) was used to compare the paired measurement means and to determine the correlation between the variables. Shapiro Wilk test was done to check for normality of the distribution of the sample and was found to be normally distributed. Correlation between variables was determined using Pearson's correlation coefficient for both upper and lower arches. Linear regression analysis was applied between the correlated variables.

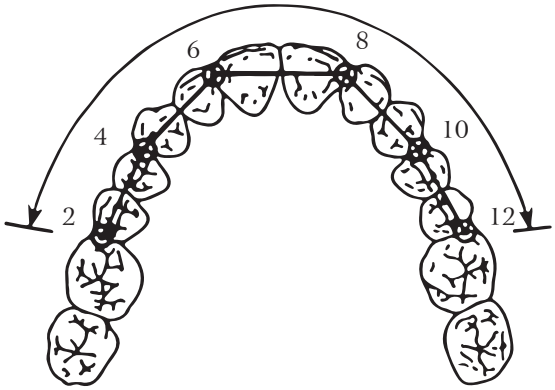

Figure 2: Arch perimeter measurement (Picture source: Adkins MD et al. Arch perimeter changes on rapid palatal expansion)[13]

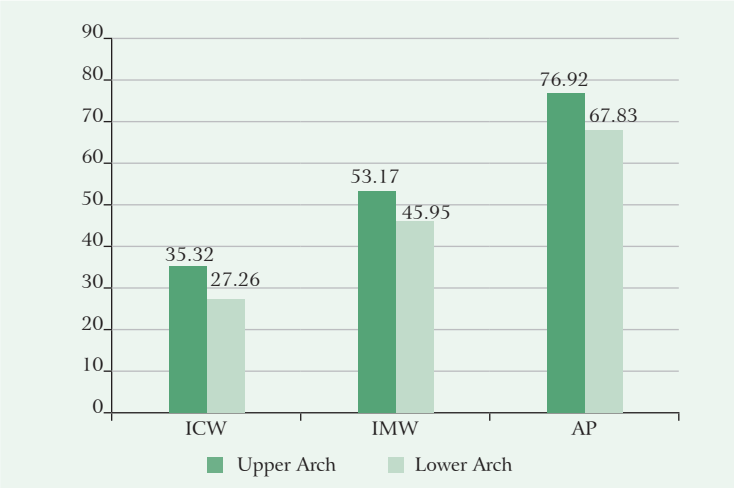

Figure 3: Mean dimensions of ICW, IMW and AP in upper and lower arches (in mm)

RESULT

The total number of sample was 124 including 62 male and 62 female samples, with a mean age of 19.56±3.98 years. The mean dimensions of AP, ICW and IMW in both upper and lower arches is shown in Figure 3.

Table 1: Correlation between AP, ICW and IMW in upper arch

Variable		ICW	IMW
ICW	Pearson Correlation	1	.522**
	Sig. (2-tailed)	---	.000
	N	124	124
IMW	Pearson Correlation	.522**	1
	Sig. (2-tailed)	.000	---
	N	124	124
AP	Pearson Correlation	.477**	.398**
	Sig. (2-tailed)	.000	.000
	N	124	124

***. Correlation is significant at the 0.01 level (2-tailed).*

Table 2: Correlation between AP, ICW and IMW in lower arch

Variable		ICW	IMW
ICW	Pearson Correlation	1	.479**
	Sig. (2-tailed)	---	.000
	N	124	124
IMW	Pearson Correlation	.479**	1
	Sig. (2-tailed)	.000	---
	N	124	124
AP	Pearson Correlation	.494**	.637**
	Sig. (2-tailed)	.000	.000
	N	124	124

***. Correlation is significant at the 0.01 level (2-tailed).*

The correlation between AP, ICW and IMW of the upper and lower arches is shown in Table 1 and 2. Moderate correlation was found between ICW-AP (r= 0.477) whereas, low correlation was seen between IMW-AP (r=0.398) for upper arch. Moderate correlations were found between ICW-AP (r = 0.494) and IMW-AP (r = 0.637) for lower arch.

The regression equationswere established between AP, ICWand IMW:

AP= 0.87 × ICW + 46.07 (Upper arch)

AP= 0.67 × ICW + 49.61 (Lower arch)

AP= 0.75 × IMW + 33.55 (Lower arch)

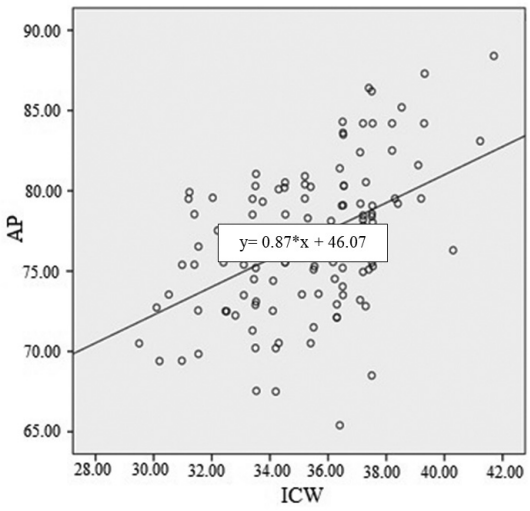

Figure 4: Scatter plot for arch length versus inter-canine width for upper arch

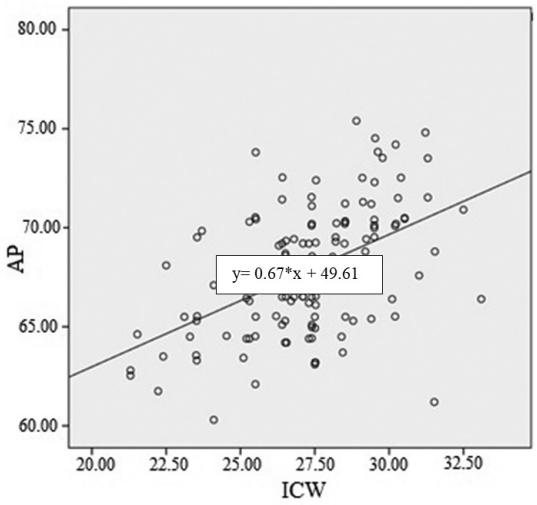

Figure 5: Scatter plot for arch length versus inter-canine width for lower arch

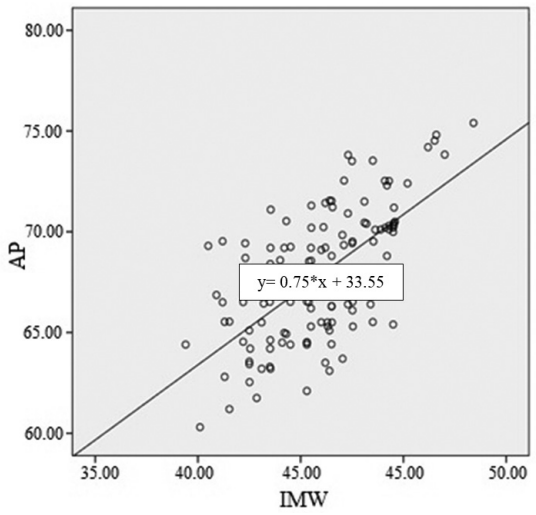

Figure 6: Scatter plot for arch length versus inter-molar width for lower arch

DISCUSSION

The present study found a correlation between AP with ICW and IMW in sample patients who had not been orthodontically treated. The orthodontic treatment can change the natural dimensions of the dental arch.[19] Hence, the findings cannot be compared to those studies conducted on the sample patients who had previously undergone orthodontic treatment.

An increase in arch perimeter is observed at mixed dentition period until the development of permanent dentition is completed, which diminishes with age particularly in the lower arch.[20] Hence, separate arch perimeter prediction equations are proposed by the current study; each for the upper arch and the lower arch.

The findings of the present study indicated moderate correlations between ICW-AP and IMW-AP for lower arch and ICW-AP for upper arch. Highest correlation was seen between AP and IMW in lower arch, indicating that the changes in one magnitude may directly affect the other. Low correlation was seen between IMW-AP for upper arch, indicating no linear correlation.

Germane et al (1991)[14] found a correlation in patients after orthodontic treatment; hence the findings of the present study cannot be compared. However, their report suggested that the increase in arch perimeter were highest in incisor regionfollowed by canine and molar region.

The present study showed 0.75 mm of arch perimeter increase as a consequence of mandibular inter-molar expansion which was greater than the values of Ricketts et al (1982)[12] and Motoyoshi et al (2002)[15] of 0.25 mm and 0.37 mm, respectively.

Paulino et al (2008)[10] reported high correlation observed between AP and ICW in both arches while a weak correlation between IMW and AP in both arches which was in disagreement with the results of the present study. They found that for an increase of 1 mm in ICW, the AP increases approximately 1.36 mm both in upper and lower arches. In contrast, the result of our study showed an increase of 0.87 mm and 0.67 mm of AP, for upper and lower arches respectively, for 1 mm increase in ICW.

To overcome any possible limitation of the present study, a longitudinal study is highly advisable to follow up the consecutive developmental changes. Larger sample size with different age groups could be used in future studies.

CONCLUSION

The regression equations for the prediction of arch perimeter have been established for upper and lower arches for Nepali sample. The values of inter-canine width and inter-molar width will help to predict the value of arch perimeter and vice-versa. For an increase of one millimeter in inter-canine width, the arch perimeter increases approximately 0.87 mm and 0.67 mm in the upper and lower arches, respectively. For an increase of one millimeter in inter-molar width, the arch perimeter increases approximately 0.75 mm in the lower arch.

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Morphological Analysis of Cemento-enamel Junction in Permanent Dentition based on Gender and Arches

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ABSTRACT

Introduction: Cemento-enamel junction (CEJ) is the site where enamel, covers the anatomical crown and the cementum which covers the clinical root at cervical region of the tooth. The CEJ has increased susceptibility to radicular caries and non-carious lesions. It has become an area of interest due to its participation in restorative procedures and exposed area in periodontal disease. CEJ serves as an important reference point for diagnosing the severity of gingival/periodontal conditions.

Objective: To observe the types of cemento-enamel junction in permanent dentition of a selected Nepali sample.

Materials & Method: A cross-sectional comparative study was conducted in sixty maxillary and mandibular permanent teeth from patients of both sexes. Longitudinal ground sections were prepared to study the morphological inter-relationship between cementum and enamel. Each specimen was viewed under a light microscope. Sample teeth were sectioned buccolingually and grounded to a uniform thickness of 250 μm manually.

Result: Among, total 60 sample; 25(41.7%) showed edge-to-edge cementum and enamel relation, 20(33.3%) had cementum overlapping enamel, and 12(20%) showed gap junction, while 3(5%) sample showed enamel over cementum relation. In the maxilla, edge-to-edge relation was more common whereas cementum-overlapping-enamel was common in mandible. Chi-square test revealed no statistically significant differences in the frequency of the type of CEJ based on gender and dental arches($p>0.05$).

Conclusion: Although no significant statistical differences were observed based on gender and arches, there were considerable morphological variations in CEJ based on tooth type. Hence, dentists are advised to be cautious when performing dental procedures involving the CEJ.

Keywords: Cemento-enamel junction; morphology; permanent dentition

INTRODUCTION

Cemento-enamel junction (CEJ) is an area of the union of the cementum and enamel at the cervical region of the tooth.[1] During odontogenesis, the enamel organ plays an important role in root development after the enamel and dentin formation has reached the future cemento-enamel junction; by forming Hertwig's Epithelial Root Sheath (HERS). The epithelial root sheath loses its structural continuity and promotes cementum deposition on the newly formed dentin. After this fragmentation, it also participates in cementogenesis and formation of the periodontal ligament. Due to the rapid sequence of proliferation and destruction of HERS, the CEJ cannot be seen as a continuous layer on the surface of the developing root.[2]

CEJ of permanent teeth is covered by the gingival tissue which after the third decade of life is located at the gingival sulcus. This occurs to compensate for the continuous passive eruption of teeth.[3] The exposure of the previously hidden structure may lead to dentinal hypersensitivity upon having hot/cold, sweet/salty foods. The CEJ has increased susceptibility to radicular caries and non-carious lesions.[4] It has become an area of interest due to its participation in the restorative procedures, exposed area in periodontal disease, during the aging process which causes exposure of the CEJ. Cemento-enamel junction serves as an important reference point for diagnosing the severity of gingival/periodontal conditions.[5] Analysis of the anatomy of the cemento-enamel junction helps to explain pathological processes that occur in this region, as well as for the identification

of the biological phenomena involved in the initiation of pathological processes, such as external cervical resorption.[6]

Very few prevalence studies of cemento-enamel relationships in the context of Nepal have been conducted. Hence, the study aims to evaluate various morphological variation in the CEJ in sampled Nepali population.

MATERIALS AND METHOD

A cross-sectional study was conducted on permanent teeth in Kantipur Dental College (KDC), Teaching Hospital and Research Center. Ethical approval was obtained from the Institutional Review Committee of KDC.

The sample size was calculated using the following formula:

$$\text{Sample Size (n)} = \frac{Z^2 p(1-p)}{e^2}$$

Prevalence of cause of extraction of teeth (p)= 17.44[7], Z= 1.96 at 95% of Confidence Interval; Margin of error (e)= 10%

N=55

Considering 10% non-response rate, total sample size = 55+10% of 55=60

Human permanent teeth with the intact cervical area and without any restorations, extracted for orthodontic or prosthetic reasons, caries (unaffecting the cervical region) were included in this study. Teeth with developmental anomalies, cervical caries, restorations, abrasion/ erosion, resorption on cervical region, exposure of CEJ due to periodontal disease, or gingival recession were excluded from this study.

Freshly extracted permanent teeth from individuals were collected from the Department of Oral and Maxillofacial Surgery. The extracted teeth were thoroughly cleaned with sterile water and were preserved in 10% formalin solution immediately after extractions till the ground sections were prepared. For making ground section, hand grinding method was used.[8,9]

All the teeth were sectioned longitudinally in the buccolingual plane as close as possible to the central axis of the tooth using a carborundum disc under constant water spray. They were thinned to 250 μm thick ground section by using Arkansas stone (Figure 1). The thin sections were observed under a light microscope after mounting. The mounted samples were observed under Labomed, iVu 3100 compound light microscope at a magnification of X40.

The teeth were categorized based on gender, arch type (maxillary and mandibular), and teeth type (incisors or anteriors, premolars, and molars).

The various relationship of cemento-enamel junction was classified into:[6] Cementum overlapping enamel (COE)– I, Cementum and enamel edge to edge (Butt) – II, Cement and enamel fail to meet (gap) – III, and Enamel overlapping cementum (EOC) – IV (Figure 2).

The obtained data were tabulated in MS Office 2013 Excel spreadsheet (Microsoft Corp., Redmond, WA) and subjected to statistical analysis using Statistical Package for Social Sciences version 21.0 (SPSS Inc., Chicago, IL, USA). The variation of CEJ was compared based on gender and arches using the Chi-square test.

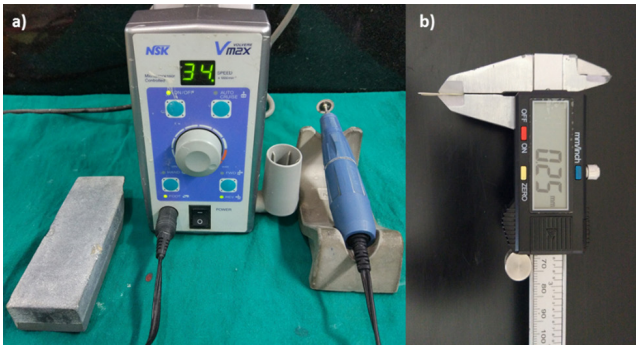

Figure 1: a) Micromotor, Carborundum disc and Arkansas stone used for sectioning and thinning of teeth b) Confirmation of the thickness of a thin section of teeth

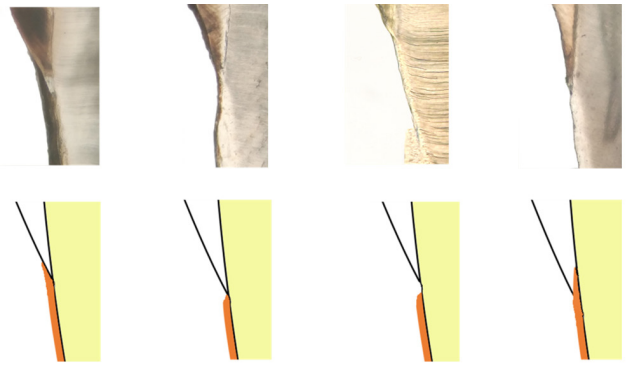

Figure 2: Types of CEJ

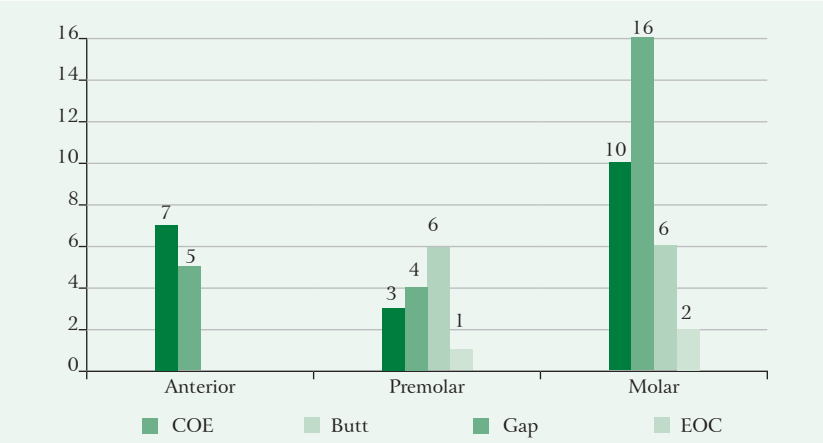

Figure 3: Types of CEJ based on Teeth type

RESULT

A total of 60 permanent teeth (30 maxillary, 30 mandibular) were observed, the mean age of the sample population was 43.40±14.97 years. The CEJ presented with four different relationships as shown in the Table 1. The distribution of CEJ based on teeth type is shown in Figure 3. No statistically significant correlation was found among the various CEJ types with gender and arch (p>0.05), (Table 2).

Table 1: Prevalence of types of CEJ

Types of CEJ	n=60	%
Cementum overlapping enamel (COE)	20	33.33
Edge to edge (Butt)	25	41.66
Gap junction	12	20
Enamel overlapping cementum (EOC)	3	5

Table 2: Comparison of different parameters using the Chi-square test

Parameter	Features	Sample size	COE	Butt	Gap	EOC	p-value (sig. 0.05)
Arch	Maxilla	30	9	16	4	1	0.281
	Mandible	30	11	9	8	2	
Gender	Male	30	13	11	6	0	0.160
	Female	30	7	14	6	3	

DISCUSSION

Cemento-enamel junction is a static landmark that can serve as a reference site to assess periodontal destruction.[10] Choquet (1899)[11] determined the types and prevalence of CEJ through optical microscopy which showed four types of tissue interrelations: enamel overlapped by cementum; enamel, cementum edge-to-edge; a gap between enamel and cementum; and enamel overlapping cementum.[6] In about 60% to 65% of cases, cementum was found to overlap the enamel. In about 30%, an edge-to-edge, and 5% to 10%, the cementum and enamel fail to meet resulting gap junction.[12]

In the present study, the edge to edge was found to be most prevalent (41.66%). This was in accordance with the study by Thakur K et al,[13] Rora et al,[14] Asteker et al.[15] It was also observed that this type was prevalent in females in our study.

The cementum overlapping enamel was the second most prevalent type of junction (33.33%). The deposition of heterogenous hard tissues can be explained by the process of odontogenesis. This occurs when the enamel epithelium degenerates at its cervical termination, permitting the connective tissue of the dental sac to come in direct contact with the enamel surface. Thus the connective tissue cells differentiate into cementoblast that deposit a layer of cementum.[16]

External resorption was seen when the exposed dentin was associated with the presence of bacteria.[17] The exposure of dentin alone cannot be a sole cause for the resorption process as the organic components are within a well-organized mineralized tissue.[18] The presence of non-union of the enamel and cementum makes the tooth more susceptible to the action of the oral environment

that may lead to penetration of noxious agent within the dentinal tubules inducing an inflammation. Other harmful possibilities are increased dentinal sensitivity secondary to the bleaching procedure.[19] The failure of the disintegration of HERS results in the inability of the connective tissue to bond with the dentin leading to an exposed area on the surface.[20] One hypothesis suggests that the loss of control of the timing of apoptosis would lead to a delay in the disintegration of HERS during initial root formation. If the HERS persist, there is a lack of cementum deposition along the dentinal surface apical to the enamel resulting in the gap relationship. Another hypothesis suggests heterogeneous tissue induction during the process of mineralization.[6]

The fourth type of CEJ (enamel overlapping the cementum) was observed using optical microscopy.[6] We found that it was least (5%), which was similar to other previous studies.[6,8,14,21] From the embryological point of view the fourth type of CEJ, enamel over cementum could not be explained as cementogenesis is initiated only after the enamel has been formed completely. Muller and van Wyk, 1991[22] demonstrated it to be caused by an optical illusion that arose due to the thickness of ground sections. However, it has also been observed in deciduous dentition when observed under scanning electron microscopy.[21] Hence, the presence of the fourth type is debatable.

Considering the tooth type and arch type, variation in the CEJ was observed within them. There was more prevalence of COE type in the, premolars had increased gap junction, and edge to edge relationship was prevalent among the molars. Ansari et al[8] observed the cementum overlapping enamel type to be prevalent in the posteriors and also in both the arches. The CEJ was found to have greater morphological diversity in the same tooth as well as teeth type. Hence, Neuvald and Consolaro[6] suggested to use junction to be called a dentin-cemento-enamel junction.

These different types of CEJ have clinical significance in the presence of disease (e.g., gingivitis, recession of gingiva with exposure of CEJ, loss of attachment of supporting periodontal fibers in periodontitis); cervical sensitivity, caries, and erosion; and placement of the margins of dental restorations.[23] Hence, CEJ is a significant landmark for probing the level of the attachment of fibers to the tooth in the presence of periodontal disease.[23]

CONCLUSION

It has been observed that CEJ shows discrepancies depending on the teeth type. This area is frequently involved in the various restorative and periodontal treatments. Hence, clinicians are advised to undertake suitable measures when operating in the neck of the teeth. Otherwise, the violation of the morphology may increase the susceptibility to radicular caries and various non-carious pathologies.

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CONFLICT OF INTEREST

This study had been presented as poster by the authors in 1st Annual Conference of Nepal Association for Dental Research on 14th December, 2019, Kathmandu.

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Taurodontism in Multiple Teeth in Child with Down's Syndrome- A Case Report

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ABSTRACT

Taurodontism is a rare dental anomaly that presents with teeth that are characterized by elongated pulp chambers and apical displacement of bifurcation or trifurcation of the roots forming a rectangular shape. The tooth lacks the constriction at the level of the cemento-enamel junction (CEJ). It affects the permanent molars in higher frequency but cases have also been seen in the primary dentition of all quadrants. The anomaly occurs as an isolated trait most frequently but its association with various syndromes has been reported. The present case is of a child of Down's Syndrome presenting with multiple taurodontism affecting both the primary and permanent molars.

Keywords: Down's Syndrome,Taurodontism.

INTRODUCTION

Taurodontism is also known as Bull tooth, "Tauros" in Latin means a bull and "Odus", in Greek means a tooth. It is an aberration of teeth with lack of the constriction at the level of the Cemento enamel Junction (CEJ) and is characterized by elongated pulp chambers and apical displacement of bifurcation or trifurcation of the roots thereby giving it a rectangular shape. It was first described by Gorjanovic- Kramberger, but the term Taurodontism was first given by Sir Arthur Keith (1913).[1]

A wide discrepancy is seen in the prevalence of taurodontism in different populations, ranging between 5.67% and 60% with equal prevalence in both the sexes. It is more commonly seen in permanent as compared to primary teeth and can affect a single tooth or several molars, unilaterally or bilaterally. [2,3]

Though the etiology of taurodontism is clearly identified; but it may be due to impaired invagination of Hertwig's sheath at its actual horizontal level. Another proposal is interference in the pitheliomesenchymatose induction.[4] A genetic transmission of Taurodontism and its association with an increased number of X chromosomes have also been suggested.[5] It is associated with numerous syndromes that include Amelogenesis imperfecta, Down's syndrome, Ectodermal dysplasia, Klinefelter syndrome, Lowe syndrome and rare ones like Smith-Magenis syndrome, Williams syndrome, Mccune-Albright syndrome and Vande Woude syndrome.[3,5,6]

The teeth are identified radiographically by the presence of elongated pulp chambers and apical displacement of bifurcation or trifurcation areas of the roots. The distance from the bifurcation of roots to the CEJ is greater than the occluso cervical distance. Clinically the pulp chamber has a greater apico-occlusal height suggesting a false sense of perforation of the access cavity. It lacks the constriction at the CEJ giving it a rectangular shape.[3]

Shaw has classified taurodontism into three categories based on the relative amount of apical displacement of pulp chamber floor:

a. Hypotaurodont: moderate enlargement of the pulp chamber at the expense of the roots
b. Mesotaurodont: pulp is quite large and the roots short but separate
c. Hypertaurodont: prismatic or cylindrical form where the pulp chamber nearly reaches the apex and then breaks up into 2 or 4 channels.[4]

Jorgensen[7] suggested another classification of primary teeth into two types.

Type I- The height of the root stem, the vertical distance between the amelo-cemental junction and the most apical point of the root bifurcation, is <2.5 mm

Type II – The height of the root stem is > 2.5 mm.

Shifman & Chanannel (1978) categorized it based on taurodontic index (TI)

Point A : lowest point at the occlusal end of the pulp chamber

Point B : highest point at the apical end of the chamber.

A tooth is diagnosed with taurodontism if the index (TI) ≥ 20. TI of 20-30 indicates hypotaurodontism, TI of 30-40 is mesotaurodontism and 40-75 is hypertaurodontism.[3]

CASE REPORT

An 11 year old boy reported to the department of Pediatric Dentistry, Kantipur Dental College, with a chief complaint of pain in the upper left back tooth region. The primary first and second molars on upper left side had deep caries with loss of tooth structure (Figure 1). The periapical radiograph of upper left posterior teeth revealed the presence of dental caries involving the pulp in 64 and 65. The 65 and 26 showed large pulp chamber and apical furcation region indicating taurodontism (Figure 2). Further evaluation carried out by an Orthopantomogram (OPG) revealed the presence of Taurodontism in all the primary second molars- 55, 65, 75, 85 as well as first permanent molars- 16, 26, 36, 46 and mandibular primary first molars – 84, 85 . All the involved teeth were hypertaurodonts. Since the premolars and permanent second molars were still in their developmental stage, it was difficult to assess them. It was also observed that the premolars- 14, 15 and 25 were missing (Figure 3). The child was a case of Down's syndrome with no other systemic manifestations. The treatment was planned as extraction of 64 and pulpectomy of 65 and restorations of 55, 74 and 75. The child underwent extraction of 64 and was recalled for other treatment (Figure 4). The patient did not come back for any further treatment.

DISCUSSION

The case presented is of multiple taurodontism involving both primary and permanent teeth in a child with Down's syndrome.

Various theories concerning the aetiology of taurodontism are suggested: a specialised or retrograde character, a primitive pattern, a Mendelian recessive pattern, an atavistic feature and a mutation.[8] Taurodontism appears as an isolated anomaly but may be associated with several syndromes.[4] In the present case, it was associated with Down's syndrome.

Figure 1: Intraoral picture of maxillary teeth

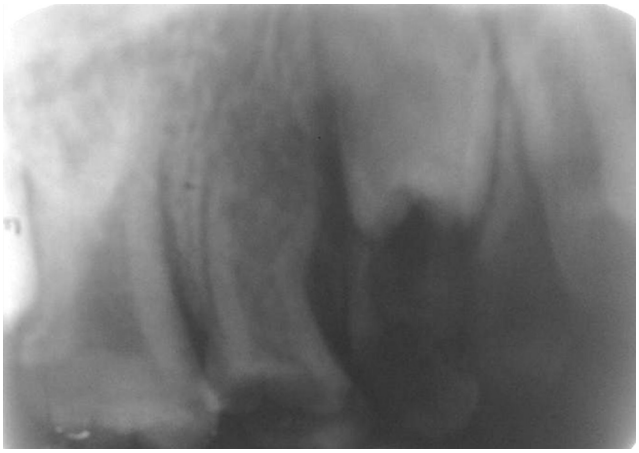

Figure 2: Intraoral Periapical radiograph of upper left posterior teeth

Figure 3 : Orthopantomogram

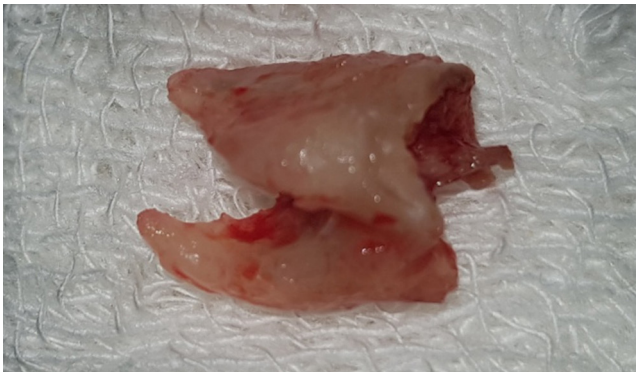

Figure 4: Extracted 64

The case revealed the presence of taurodontism in all four permanent and six deciduous molars. Permanent teeth are reported to be more frequently affected than primary teeth. However here it was present in both primary as well as permanent teeth similar to report by Ashwin et al.[9] mandibular molars are reported to be affected more often than maxillary molars which was also noted in this case, in contrast to that reported by Ashwin et al.[9]

Taurodontism is identified on the basis of radiographs, as the external appearance of the tooth has normal configurations and is often detected accidentally.[8,10] The taurodontism in this case was found accidentally on a radiograph for a decayed tooth.[10] Taurodontism need to be differentiated from other conditions like dentinogenesis-imperfecta, pseudohypoparathyroidism, hypophosphatasia, hypophosphataemia and vitamin D-resistant dependent rickets.[8]

All the involved teeth in our case were, hypertaurodontism, in which the furcation is seen in the apical region based on the classification given by Shaw.[4]

The wide variation in the size, shape and configuartion of the pulp chamber, as well as potential for additional root canal systems leads to challenges in endodontic management. The pulp canal orifices is difficult to visualize as the pulpal floor is seen more apically often giving a false sense of perforation thereby making the negotiation of canals difficult and the debridement of pulp tissue from this large pulp chamber time consuming.[3-5]

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Non-Surgical Management of Localized Gingival Enlargement in Maxillary Anterior Region

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ABSTRACT

Gingival enlargement is the multifactorial condition. The most commonly encountered form of gingival enlargement is inflammatory gingival enlargement which may either be acute or chronic. The most common causative factors being local irritating factors, dental plaque, faulty restorations etc. It is usually confined to interdental papilla while in severe cases, it may involve marginal gingiva or even an entire crown structure. Treatment modalities for inflammatory gingival enlargement include removal of local irritating factors, meticulous plaque removal and surgical excision of the lesion. However, this article reports successful management of inflammatory enlargement by non-surgical periodontal therapy alone.

Keywords: Gingival enlargement; maintenance therapy; non-surgical periodontal therapy

INTRODUCTION

Gingival enlargement is defined as an increase in size of gingiva, which has many causes and can manifest with various clinical characteristics.[1] A change in the dimension of gingival tissue is always a pathologic event. It can be transient and reversible or can be chronic and irreversible.[1] Extent and severity of gingival enlargement can be measured by various methods. Indices are important for quantification of the enlargement.

One of the most common type of gingival enlargement is inflammatory enlargement which may either be acute or chronic. Inflammatory gingival enlargement begins as a slight ballooning of the interdental papilla and marginal gingiva. Initially, there is swelling around the involved teeth which can increase in size until it covers part of the crown.

In addition to the acute and chronic forms of gingival enlargements associated with gingivitis, inflammatory lesions can be observed in other forms of gingival enlargement. There are various systemic conditions which are associated with inflammatory changes in gingiva. The distinction should be made early in treatment planning, and the involvement of drugs, systemic conditions, and neoplastic lesions should be carefully ruled out. Non-surgical therapy mainly aims to improve tooth longevity by preventing soft and hard tissue damage of the supporting periodontium.[2]

CASE REPORT-I

A 39 years old female came to the Department of Periodontics, Kantipur Dental College and Hospital, Basundhara, Kathmandu with a chief complaint of localized painful swelling of gingiva in the upper front region of jaw for one year which was associated with bleeding. According to the patient, she had visited several dental clinics for same problem where she had undergone scaling of her teeth. After scaling, the size of gingival swelling and bleeding were reduced, but it recurred. The patient also had a history of trauma in the same region 10 years back, which was associated with occasional pain.

On general examination, the patient was moderately built and nourished. The patient was systemically healthy and not under any medications.

On intraoral examination, there was generalized inflammation of marginal gingiva and localized enlargement of interdental papilla in maxillary anterior

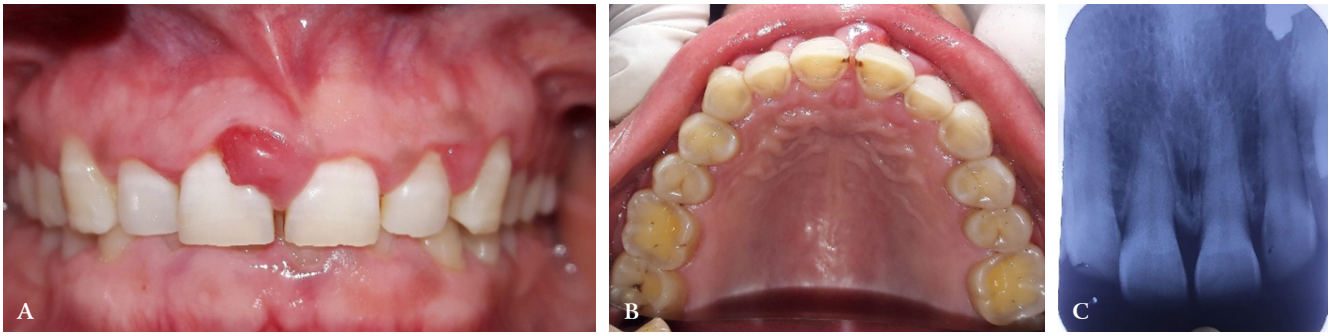

Figure 1: Initial clinical presentation of swelling a) facial aspect, b) palatal aspect, c) periapical radiograph of involved teeth.

Table 1: Different phases of treatment

Visit	Treatment done
First visit	Complete ultrasonic scaling was done. Oral hygiene instructions were given. Modified bass technique of tooth brushing was demonstrated and instructed to implement in daily practice. Chlorohexidine 0.2% 10ml twice daily for one week was prescribed and recalled after one week.
Second visit after one week	Slight reduction in size and reduction on bleeding on probing was reduced. Gingival curettage under local anesthesia was done with respect to 11 and 21. Patient was asked to continue chlorohexidine for another week. Evaluation of brushing technique done; further oral hygiene instructions were given. Patient was motivated for oral hygiene maintenance. Patient was sent for orthodontic consultation for deep bite and was recalled after one month.
Third visit after one month	Re-evaluation of swelling was done.
The patient was recalled every three months thereafter and followed up till one year to check for any uneventful healing. There was no recurrence during the follow-up period. The gingiva presented with signs of clinical health on one-year recall visit (Figure 4). The patient was able to maintain a good oral hygiene and regularly came for recall appointments.	

Figure 2: Follow-up at one week after completion of ultrasonic scaling.

Figure 3: Follow-up at one month after gingival curettage.

Figure 4: Follow-up at one year.

region i.e., between upper central incisors. Enlarged interdental papilla was red, smooth, slightly erythematous, and non-ulcerated. It was associated with bleeding on probing but there was no exudate or pus discharge associated with swelling. Pocket probing depth of 7mm was measured on mesio-facial aspect of 11 and 21. On hard tissue examination, the patient had generalized attrition, severe deep bite and spacing between upper central incisors.

Periapical radiograph with respect to 11 and 21 revealed normal periapical region and slight loss of interdental bone between 11 and 21. Pulp vitality test was done which revealed vital upper anterior teeth.

Complete blood investigations were done to rule out any predisposing systemic disorders. The treatment plan was explained to the patient and a written consent was obtained.

Figure 5: Initial clinical presentation of swelling a) facial aspect, b) palatal aspect.

Figure 6: Follow-up at two weeks of non-surgical periodontal therapy.

Figure 7: Follow-up at one month of non-surgical periodontal therapy.

CASE REPORT-II

A 23 years old systemically healthy female patient came to the Department of Periodontics, Kantipur Dental College and Hospital, Basundhara, Kathmandu with the chief complaint of swollen gum in the upper front region of jaw for one and half year which was associated with bleeding while brushing. Patient had undergone scaling of her teeth after which, the swelling reduced in size but it appeared again.

On examination, there was localized enlargement of interdental papilla in between upper central incisors. Swelling was soft, edematous and showed bleeding on probing on provocation. It was not associated with pain and exudate/pus discharge. Pocket probing depth of 5 mm was measured on mesio-facial aspect of 11 and 21. On hard tissue examination, the patient had minor deep bite. The treatment plan was explained to the patient and a written consent was obtained.

Phase I therapy was initiated at the first visit. Complete ultrasonic scaling was done. Gingival curettage was done under local anesthesia with respect to 11 and 21. Irrigation was done with chlorohexidine. Oral hygiene instructions were given. Modified bass method of tooth brushing and technique of flossing was demonstrated to the patient and advised to follow it. Reinforcement of oral hygiene instructions was done at every visit.

DISCUSSION

Inflammatory gingival enlargement is the most commonly encountered condition which may either be acute or chronic. Mechanical, chemical, or physical irritation are responsible for acute enlargement which be resolved by elimination of the irritant.[1] Mouth breathing, impacted food items, and poor oral hygiene are usually responsible for acute inflammatory reactions in gingival tissues. These lesions are usually confined to marginal or papillary gingiva.

Microbial biofilm is commonly associated with chronic inflammatory gingival enlargement. Dental plaque can be linked to a lack of proper oral hygiene, orthodontic appliances, faulty restoration margins, malaligned teeth, oral habits, an open bite, or other factors. Poor oral

hygiene, irritation by anatomic abnormalities, and improper restorative and orthodontic appliances favor plaque accumulation and retention.[1]

Gingival as well as periodontal diseases is a multifactorial disease. Understanding the etiology is crucial before starting with any treatment options. Removal of supra- and subgingival bacterial deposits by scaling and root planing has been the basic approach to treat periodontal infections. Nonsurgical mechanical periodontal treatment is the first recommended approach to control periodontal infectionsdue to which, it isregarded as cornerstone of periodontal therapy.[3] Although nonsurgical periodontal therapy has evolved over the years, it is still considered to be the "gold standard" to which other treatment methods are compared.

Before starting with any periodontal treatment, it is essential to consider all factors that might influence the therapeutic objectives and selection of the treatment procedures.[4] Baehniand Giovannoli discussed in detail about the various factors that need to be considered in the management of periodontal patients and how the clinician should devise a treatment plan which incorporates the patient's profile and demands.[4] The effectiveness of the nonsurgical approach in treating periodontal infections have been confirmed by many clinical studies conducted in the past few decades.[5-8]

Gingival overgrowth causes esthetic, functional, psychological, and masticatory disturbance of the oral cavity. Complete removal of gingival mass is the treatment of choice which can improve the above-stated problems and enable patients to improve plaque control. Patient education and proper oral hygiene maintenance play a vital role in future maintenance. The main aim of non-surgical therapy is to reduce the inflammatory component in gingival tissues and thereby avoid the need for surgery. So, in this case, treatment was done only by non-surgical periodontal therapy i.e., scaling, root planning and curettage. Use of such conservative approach to treat gingival enlargement will reduce discomfort to the patient caused by surgical therapy. Also, we can motivate them about proper oral hygiene measures to reduce the inflammation.

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Dr. S. Bhattacharyya: A Living Legend

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[2]Professor/Principal, Kantipur Dental College, Kathmandu, Nepal

Dr. Subroto Bhattacharyya is among the initial oral pathologists of India. He has served for more than 55 years in dentistry at clinical, academic and administrative services. He was born on 22nd July 1939. After completing BSc in 1955, he obtained BDS degree from University of Calcutta with honors in the year 1959. After completing BDS, he joined Nair Hospital Dental College, Bombay as post-graduate student and completed MDS in Oral Pathology & Bacteriology in 1962. He was subsequently awarded Fellow of the International College of Dentists (FICD), USA.

He was appointed as Civil Assistant Surgeon in January 1963 at the government SMS Medical College - Dental Wing, Jaipur. As a pioneer, he was very passionately involved in developing the Department of Oral Pathology right from the day of joining the institution in Jaipur. In 1983, SMS Medical College started BDS course in Rajasthan with 15 admissions to the course. He has rendered continuous 33 years of his selfless service, succeeding from Lecturer to heading the department as a persuasive, resilient, and ardent leader till 1995.

Dr Bhattacharyya's experience at SMS Medical College – Dental Wing, Jaipur is worth remembering. He had very limited equipment and instruments with no slides, no technician to support the teaching learning activities. He managed the department in spite of those limitations. He developed the skill to describe oral diseases and lesions using blackboard till the authorities provided the required modern equipment. Thus, he successfully established the first formal Department of Oral Pathology and Microbiology at SMS Medical College, Jaipur.

After completing his tenure of government service, he was invited to shoulder another major responsibility of establishing a dental college and department of oral pathology, oral medicine and oral histology at the Farooqia Dental College, Mysuru, Karnataka in 1995, and served till 2009.

Life Time Achievement Award presented to Prof Bhattacharyya by IAOMP

After serving for a long tenure of 14 years at Mysuru, India he served in Nepalgunj Medical College, Banke, Nepal for a brief period. Then he rendered his constructive services as the Principal & Professor, and Head of Oral Pathology Department at Kantipur Dental College, Kathmandu, Nepal from Sept 4, 2009 to Oct 4, 2018. Once again based on his wide experience and devotion to the subject, he successfully served the institution and specifically started the first postgraduate course in oral pathology in Nepal. The department is now successfully providing the postgraduate education opportunity to the dental students of Nepal.

He was President of Jaipur Branch of Indian Dental Association and subsequently worked as President of Rajasthan State Branch of IDA. He also held the prestigious post of Member of Dental Council of India. He has been a Convenor-Board of Studies at University of Rohtak, Haryana, Member- Board of Studies at Rajiv Gandhi University of Health Sciences, Karnataka, Member-Panel of experts at Dental Division, All India Institute of Medical Sciences, Delhi, and PG Coordinator for dentistry at Kathmandu University, Dhulikel, Nepal. He has been invited to several universities as Subject Expert for the formulation of syllabus and as Examiner for undergraduate and postgraduate courses.

He has been awarded with 'Merit Award' by the Rajasthan Government during the Independence Day in the past. Dr Bhattacharyya was felicitated with 'Life Time Achievement Award' by the Indian Association of Oral & Maxillofacial Pathologists in Jaipur on November 20, 2015.

He has inculcated many young teachers the essence of teaching oral pathology, and with his modesty has taught

Prof S Bhattacharyya and Prof Rabindra Man Shrestha with first batch of PG students of KDC

many to become the worthy teachers. In fact, he has been the 'teacher of teachers'. Even at the age of 81 years, his sheer interest in dentistry and more so in oral pathology is evident. His simplicity, approachability, good nature and his humble behavior has lead him to healthy and successful life. He also owes a great deal to his better half, his wife Mrs. Reena Bhattacharyya in accomplishing his dreams in life.

After reaching the pinnacle of his service of 55 rich years, he has now decided to spend his time and attention to the younger generation – his grand children at home. He has gracefully accepted the change and is happily living in Jaipur with his family.

Change in Health Service Approach to COVID-19 Pandemic

Manisha Chaudhary
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Our planet and everything that lives on it is going through a transformation! COVID-19 which was first reported from Hubei Province of China on 31st December 2019 has now turned into a global pandemic. Before, the health services were focused on individual care and now we have started thinking about public health in an outbreak context instead. The story of origin and spread of corona virus will not simply be one of havoc, death and desolation, of a society fighting a war against nature superimposed on a war against human society. It will be a story of science, of discovery, of how one think and of how one changes the way of one think. During the ongoing COVID-19 pandemic, health care workers are at substantially increased risk of becoming infected with SARS-COV-2. Every day habits have been turned upside down, and the way of life of people all over globe, engaged in all activities, especially in health sector will necessarily be changed.

COVID-19 pandemic brings great challenges to global public health. Individuals and communities are grappling with spread of virus, the struggle to effectively treat all infected individuals and the challenges of physical distancing. Economic burden of business closure and high level of stress, exact a tremendous psychological toll on people.

With world in throes of pandemic, it may seem difficult for us to imagine what our world will look like after we move through this period? The adaptive structural changes that need to be made to meet present requirements are use of quality and complete personal protective equipment as mandated by CDC at all times. Embracement of telemedicine, rapid initiation of COVID-19 testing, treatments and clinical trials are the good aspect of the health care changes taken. Some changes that are not so good are cancellation of elective surgeries, reduction in access to specialty and diagnostic testing for non COVID-19 patients. As a direct consequence of pandemic there is a increase in number of people and increase need of mental health treatment. Sadly, a very little attention is paid to this aspect. Health services have been partially or completely disrupted in many countries.

With a paradigm shift in health care practice in progress during the current pandemic situation, telemedicine and tele-dentistry need of patients without confrontation. It has not only eliminated any chance of exposure to virus but also decreased the service cost and helps in patient education and most importantly social distancing can be maintained. According to News release of June 2020 by WHO prevention and treatment services for non-communicable diseases have been severely disrupted since the COVID- 19 pandemic began. According to WHO, among the countries reporting service disruption, globally 58% of countries are now using telemedicine to replace in-person consultation; in low income countries this figure is 42%.

Oral health service is one of the most highly exposed clinical departments to respiratory tract pathogens due to potential aerosol transmission risk. Routine dental practices have been suspended. The basic approach by the dental team performing the double triage considers each patient as SARS-COV-2 positive until proven otherwise and uses protective equipment in order to protect their own health and the health of patient. Tele-dentistry has been a great assistant in current pandemic situation. The use of newer technologies has not only enhanced the quality of management of dental patients but also has made partial or complete management of patients living miles away from health care centers. The highest level of personal protective equipment is recommended to be used

by a dental practioner which includes gloves, gowns, head cover, shoe cover, eye protection including goggles or a face shield and higher-level respirator. A combination of surgical mask and full-face shield is used in situation where respirator is not available. Good hand hygiene is best way to prevent spread of infection. Intraoral X-ray is the most common radiographic technique. But there is increased saliva production while taking intraoral X-ray. Extra-oral dental radiograph such as panoramic radiography and cone beam computed tomography (CBCT) area appropriate alternatives during the outbreak. Less invasive treatment procedure is preferred.

COVID-19 pandemic demands rapid response. We will be forced to learn quickly about what works and what doesn't. Even before pandemic, global health and development community has had to stretch its resources to meet global challenges and life-saving commodities have been underfunded. This pandemic will force us to articulate what matters most and to prioritize investment.

The pandemic has opened doors to innovation. People are working globally to mobilize crisis resources, adjust operations for enhanced screening, sanitization and social distancing measures and harness telepath capabilities to deliver heath care remotely.

Health care is constantly changing to cover more patients, adapting to new technology and prepare for future pandemic. As health care personnel, it is important for all of us to understand the implications of potential transmission of SARS-CoV-2 virus in a clinical setup and be updated with any new information regarding the disease. We must be ready to "build back better" strengthening health services so they are better equipped to prevent, diagnose and provide care for patients in future in any circumstances.

Change in Health Service Approach due to COVID-19 Pandemic

Md. Qulam Safi
3rd year BDS student, Kantipur Dental College, Kathmandu

I had seen the world running for more power and development. I had seen the lives full of competitions to survive in the growing world. I had seen the streets full of peoples, the parks and malls with crowds which were full of hopes and various intentions. And I also witnessed the era of Corona –Virus-Diseases-19 (COVID-19) where everyday habits have been turned upside down from the world health to the huge cascade of socio-economic implications.

Today I see every group of people concerned and praying for good health. This importance of being healthy and surviving for life has circulated like never I have seen in my lifetime. The people giving primary importance to the medical science is a massive change in my part of the world. Many changes have been occurring in the health services approaches during this COVID-19 pandemic period as compared to Pre-COVID period.

Introducing COVID-19, it is an infectious respiratory disease caused by a novel corona virus (SARS COV-2) which was first identified in Wuhan province, China in December 2019 and World Health Organization (WHO) announced COVID-19 outbreak as a pandemic on 11th March, 2020. The initial clinical picture of the COVID -19 was pneumonia of unknown origin as the early clinical cases were presented with sign of Pneumonia. Latter it was diagnosed as SARS COV-2 Infection that was associated with severe pneumonia hence named as novel COV Pneumonia (NCP). Dealing with the unforeseen challenges caused by the COVID-19 pandemic, it has taken a significant toll on people all across the world. As the corona virus pandemic rapidly sweeps across the world, it has brought new challenges and has highlighted several strategies that should be emphasized more in management of the health care system. So, we need to update our knowledge & skills regarding infections control & follow the protocols recommended by the relevant authorities to protect the healthcare professionals and the patient against infections.

The lockdown periods as per the direction of government had changed the focus of health service only to the emergency cases initially. This was indeed necessary to cut off the crowds and risks of transmission from the hospital itself. Meanwhile, the health care providers started to prepare themselves with personal protective equipment (PPE), sanitizations and other aseptic protocols. The hospitals started to prepare more for the ICU beds, ventilators and also the isolation wards. This can introduce with the beginning of change in health sector approach due to COVID-19.

Many countries are now focusing in public health also. Driving home preventive practices, getting immunizations and sanitation has been prioritized. Virtual health care technologies like Telehealth services and Telemedicine has become norm of taking care of patients. Diagnosis, treatment and service approach at local level has been highly concerned. Public health awareness and education has been provided at it's best through different means. Separate sections have been allocated for diseased, symptomatic and asymptomatic individual at hospitals in order to prevent from spread of disease. Essential and emergency drugs have been made available in local level to reduce unnecessary visits and prevent transmission of disease.

In the context of Nepal, our country has 26,930 hospitals beds in public and private hospitals. Likewise, 1595 ICU beds and 840 ventilators are available in 194 hospitals. Recently, Ministry of Health & Population, Nepal has designated 111 hospitals to run COVID-19 clinics and 28 hospitals to treat COVID-19 cases. Also Level-I, level-II & level-III hospitals have been allocated by government for COVID infected patients. However, considering the above health systems capacity to manage active COVID-19 cases, health systems facilities will be over stretched according to the situations.

The COVID-19 however cannot shadow the other diseases prevalent in the community. The health care centers slowly started to gain their pace again. This was not only supported by the increasing number of COVID-19 cases but also by the pausation in the lock down periods. Also, with the emergency and COVID positive cases flooded in the hospitals, the health care provider themselves came upon the risk zone for being easily infected. I feel deeply saddened by many of the beautiful lives which were lost just because they were trying to save the other lives. The health workers started to be seen as a superhero in some part of the world. But in my part of world, they were also treated negatively by the society thinking them as a source of infection. The lack of proper personal protective equipment, lack of certainty towards life in terms of financial, emotional and health securities indeed have threatened the balance of life of health care providers. Still, I have seen them working with a new protective suit over their bodies, masks over their faces and gloves on their hands. The summer and sweat seemed unable to melt their service.

The health service in this pandemic has certainly increased like never before. From collecting the swab of the suspected cases, tracing other suspected as well, utilizing new diagnostic method and various treatment protocols as per the severity of case, the service seemed to be integrated from various departments. The isolations ward as per proper protocol, the proper management between the COVID positive and negative cases, proper disposal of dead body and proper care of health personnel as well seems to be highly engaging for the health centers as well.

To conclude, it has been rightly said that all the other doors of temples, churches and mosques were closed but the doors of hospitals are opened. All the other peoples started social distancing but those are the touch of health care providers which are meant for saving lives. With many difficulties and uncertainties, the health service seemed fully functional and over functional with new wears and devices to tackle with this pandemic. And today, we all have hope in this medical science only for the end of this pandemic and we rely on this health service only for our good health. Also, I feel proud to be a part of this dignified health sector.

PFA Dental Student Scholarship Program

The above two articles were the best selected work of the dental students who were recipients of "Dental Student Scholarship Program-2020"of the Oral Health Foundation of Pierre Fauchard Academy. The essays were selected by a jury of PFA-Nepal Section among the selected 3rd year BDS students of all dental colleges of Nepal. The winners were also awarded with the cash prize by PFA International.

Journal of Kantipur Dental College
Author Guideline

INTRODUCTION

The Journal of Kantipur Dental College (JKDC) is a peer reviewed, open access biannual biomedical journal. It is the official journal of Kantipur Dental College.

The JKDC works under the belief that knowledge gained through scientific research and advances should be shared and accessible. It publishes research-based articles within the field of biomedical sciences including basic sciences and clinical disciplines, public health, health care management, medical education, ethical and social issues pertaining to health care. Hence, it grants readers permission to read, download, copy, distribute, print, search and create links to the full text articles available online at www.kantipurdental.edu.np/journal without any charge. Thereby, it also aims to increase the visibility and ease of use of open access scientific and scholarly articles so as to promote their increased usage and impact. Authors do not have to pay for submission, processing or publication of articles in JKDC.

Articles are published under the following categories: Editorials/Guest editorial, Research/Original Article, Review Article, Case Report/Series, Short Communication, Book review, View point and Student KDC.

THE EDITORIAL PROCESS

The submitted manuscripts are duly acknowledged and initially reviewed for probable publication by the editors with the confirmation that they are being submitted only to the JKDC, have not been published, simultaneously submitted or accepted for publication elsewhere.

The manuscripts are then sent to expert peer reviewers blinded to the contributor's identity and vice versa for review and comments. The final decision on whether to accept or reject the article are taken by the Chief-editor based on the peer reviewer's comments. The authors are informed about the modification/acceptance/rejection of the manuscript with the peer reviewer's comments. Revised articles have to be resubmitted after making the necessary changes or clarifying questions made during the peer review process. The author may withdraw his/her manuscript prior to publication with written applications.

The accepted articles are edited for grammatical, punctuation, print style and format errors and page proofs and are sent to the corresponding author who should return them within stipulated date. Non response may result in delay in publication or even rejection of the article.

INSTRUCTIONS TO AUTHORS

Manuscripts must be prepared in accordance with "Uniform requirements for Manuscripts submitted to Biomedical Journals" developed by the International Committee of Medical Journal Editors (ICMJE) www.icmje.org. The uniform and specific requirements of JKDC are summarized below. Before sending a manuscript authors are requested to check for the instructions.

SPECIFICATION OF THE MANUSCRIPT

The language of the manuscript should be simple and legible, which must be written in British English or English (US) without grammatical, typographical and bibliographical errors. The manuscript must be proof-read before submission. Manuscript should use proper language that serves the purpose of effective communication. Manuscript should not be written in contraction. For example: can't, don't, etc.

Format: Microsoft Word (.doc or .docx) file format and all the illustrations, figures and tables should be placed within the text at the appropriate points.

Front Size/Style: 12/Times New Roman Spacing: 1.5 Border spacing: 1 inch (all sides)

Page number: Right hand bottom

Image file format: jpeg or tiff/ Resolution: 300 dpi (dot per inch)

All manuscripts must be type written and submitted to the Chief Editor, JKDC. The total number of authors including Principal author should not be more than 6(Six). Authors must submit manuscripts through email in the following address: jkdcjournal@gmail.com

TYPES OF MANUSCRIPT AND WORD LIMITS

RESEARCH ARTICLE

Research article should be divided into these sections:

Title

Title should be short not more than 15 words.

Authorship

It should contain name of the pertinent authors with their position and affiliated institution and e-mail address of corresponding author.

Abstract

It should not exceed 300 words and should be in a structured summary. All research articles should be submitted with the following subheadings: Introduction, Objective, Materials and Method, Result and Conclusion.

Keywords: 3-7 keywords arranged alphabetically separated by semicolons.

Introduction

Introduction should clearly state the problem being investigated, the background and reasons for conducting the research. It should summarize relevant research to provide context and also state how the work differs from published work. It identifies the research questions/ hypothesis that has to be answered and also explains others' findings.

Materials and Method

This section should provide sufficient details about the procedure, research design, sample selection, so that readers can understand and replicate the study. It should explain inclusion and exclusion criteria. It should give details of new methodology or give citation for previously published work.

Result

This should provide answer to research question/ hypothesis. Findings can be shown in tables and figures, and explain what was found. Presentation of results shall not be duplicated in multiple formats.

Discussion

Discussion should describe what the present results mean and what is already known about the subject. It should indicate how the results relate to expectations and new scientific knowledge. It also identifies the gaps and ideas for further study.

Conclusion

A concise conclusion which should briefly explain the importance and usefulness of the work.

Acknowledgement

All contributors who do not meet the criteria for authorship can be listed.

References

References should be listed in a separate reference section immediately following the text in Vancouver superscript system. The total number of references should not exceed 30.

Word limit

Manuscript 2500 words including figures and tables (excluding abstract and references)

Review Article

Review article must cover various aspects of the topic chosen, areas of interest and should also incorporate latest researches and findings. It should be systemic critical assessments of literature and data sources. It should include; Title up to 15 words, Abstract 300 words (structured/ unstructured), Manuscript up to 3000 words excluding references and References up to 50. There shall be no conclusion section, if needed summary section can be added.

Case Report/Series

New/interesting/ rare cases with clinical significance or implications can be reported. Valid written expressed consent should be taken prior to involving any person in case report manuscript. The identity of the patient should not be revealed in text or figures. Confidentiality should be maintained. It should include; Title 15 words, Abstract 150 words (structured / unstructured) with key words 3-5 arranged alphabetically separated by semicolons.

Manuscript should be1500 words (excluding abstract and references). The total number of references should not exceed 15.

View Point /Short communication / Book review

These articles are personal or professional views and allow the author to express their own point of view on any issues relevant to health. It should include; Title 15 words and total 1000-1500 words.

Student KDC

Student KDC section is provisioned for dental students for submitting manuscript on research/survey, case report, essay and articles on career and web-searches. Total word count should be 1000-1500 words.

Images (photographs, drawings)

If images (photographs/ line drawings) are to be included, clearly scanned images free from technical artefacts should be submitted. Magnifications, areas of key interest should be indicated by an arrow, symbol or abbreviation the details of which should be explained at the bottom of the figures. The scanning resolution should be 300 dpi (dots per inch). Title or captions and clearly numbered for each image should be provided. Figure/s should be cited in order within the text, e.g. (Figure 4).

Tables

Tables should be simple and legible. It should present only essential data with a title or caption and clearly numbered. Table/s should be cited within the text, e.g. (Table 3).

Units and abbreviations

All measurements should be expressed in Standard International (SI) units. Avoid abbreviations in the title and abstract. All unusual abbreviations should be fully explained at their first occurrence in the text.

Drug names

Generic drug names should be used.

Conflict of Interest Notification

This should be notified (if any).

Ethical consideration

Manuscripts submitted for publication should be attached with ethical clearance letter from the respective institutional ethical committee or review board.

Informed consent

Informed consent of the patients must be taken before they are considered for participation in the study. Patient identifying information such as names, initials, hospital numbers or photographs should not be included in written descriptions. Patient consent should be obtained in written and archived with authors.

Protection of human subject in research

When conducting experiments on human subjects, appropriate approval should be obtained from the Ethical Committee. All the procedures on human experimentation must be performed in accordance with the ethical standards of the responsible ethical committee (both institutional and national) and the Helsinki Declaration of 1964 (as revised in 2008).

Permission

Authors must obtain written permission for the borrowed and previously published material and submit them with the manuscript. The borrowed material should be acknowledged.

Checklist for authors before submitting the manuscript

- ✓ Covering letter
- ✓ Completely filled JKDC declaration of authorship
- ✓ Ethical committee approval
- ✓ Informed consent (if appropriate)
- ✓ Abstract
- ✓ Manuscript files including tables/figures/ pictures
- ✓ References
- ✓ Word count (Abstract/Text)

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