Oral Health Status and Practice among Buddhist Monk and Nun Students: Monastery Based Study in Nepal

Dilip Prajapati,[1] Sonam Rinchen Lama,[2] Swagat Mahanta,[3] Shreya Subedi,[4] Swastika Mahat[5]

[1]Lecturer, [2]Cluster Doctor, [3]Assistant Professor, [4,5]Internees,

[1,3-5]Department of Community Dentistry, Kathmandu University School of Medical Science, Dhulikhel Hospital,

[2]Area Welfare Centre, Kaski, Gurkha Welfare Trust Nepal.

ABSTRACT

Introduction: Oral health conditions can be largely preventable but still major health burden for many countries.

Objective: The aim of this study was to evaluate oral health status and practice among Buddhist monk and Nun students in Nepal.

Methods: Monastery based cross sectional study was performed among 422 students from six monasteries with age group 6 to 20 years old from March to October 2021. A set of oral health related questionnaire were used followed by intraoral examinations including assessment of Decayed Missing Filled Teeth (DMFT), Gingival Status and Calculus Score along with dietary habits. Statistical analysis was performed in SPSS with descriptive, Mann Whitney test and Spearman's correlation test.

Results: Oral health knowledge attitude and practice were good in compared to other school children with same age groups. The mean DMFT Score were 1.62 ± 2.19 and mean dmft 0.59 ± 1.4 with good gingival and calculus score. Very few of them (47, 11.1%) had filled permanent tooth and 98 (23.2%) of them had dental pain within past six months of study. None of them (100%) had undergone orthodontic treatment where 23% had class III Angle's Molar relationship. Dental caries showed an increasing trend in relation to age with significant moderate correlation ($r=0.35$, $p<0.05$).

Conclusions: The increased oral pain among Buddhist monk and nun with untreated dental caries regardless of sugary foods seems to be a challenging problem in monasteries with limited provision of dental service.

Keywords: *Oral health, knowledge, monk, Nepal, nun.*

INTRODUCTION

Oral health conditions is of great challenge mostly in low and middle-income countries affecting individuals causing pain, discomfort throughout their lifetime and even death.[1] Global burden of disease study 2017, reported nearly 3.5 billion people were affected by oral diseases worldwide and it also estimates that 2.3 billion people suffer from permanent teeth caries whereas more than 530 million children have primary teeth caries.[2] Dental caries is the most common chronic disease in childhood whereas middle school pediatric population's oral diseases need major attention.[3] However within the last four decades, dental caries prevalence and severity among 5-12 years old has declined.[4]

Individuals oral hygiene status can be greatly influenced by personal lifestyles and discipline where common oral diseases is directly associated with oral hygiene knowledge, practices, quality of individual hygiene, type and frequency of food intake, motivation towards preservation of individuals health with cultural and religious commitment. One third of Nepalese have been found to have self-reported dental caries with deprived oral health care facilities.[5] Buddhism is second largest religion of Nepal with 9% countries population; mainly following Tibetan Buddhism.[6] This study was conducted to evaluate oral health status and practice among Buddhist monk and Nun student's community in Nepal.

Correspondence

Dr. Dilip Prajapati
Lecturer
Department of Community Dentistry,
Kathmandu University School of medical Science,
Dhulikhel Hospital.
E-mail: dilepprajapati09@gmail.com

Citation

Prajapati D, Lama RS, Mahanta S, Subedi S, Mahat S. Oral Health Status and Practice among Buddhist Monk and Nun Students: Monastery Based Study in Nepal. J Nepal Assoc Pediatr Dent. 2021;2(2):51-6

METHODS

Study Design and Setting:

Monastery based descriptive cross sectional study was performed among 6 to 20 years old monk and nun students residing in Nepal dated from March to October 2021 which includes total six different Monasteries i.e Sherminub Institute for Buddhist Studies (SIBS) Raniban Kathmandu; Kagyu Institute of Buddhist studies (KIBS) Kirtipur; Tsungon Nangkyi Gumba Shivapuri Kathmandu; Dhubgyu Chorkhorling Monastery Matepani (DCLM) Pokhara; Jangchub Choeling Monastery (JCM) Pokhara and Dhagpo Sheydrupling Monastery (DSGLM) Nala, Kavre. Ethical approval for the study was obtained from Institutional Review Board (IRB) Kathmandu University School of Medical Science (KUSMS) approval number 07/21. Both verbal and written consents were taken from monastery teachers and individuals from respective institutes. The monastery students willing to participate in this study from 6 to 20 years old were included in this study.

Sampling and data collection:

Purposive sampling techniques were done within inclusive conditions with well explained purpose of the study. Data collection were done using 18 self-structured oral health related questions which included three sets of oral health knowledge, four sets of oral health attitude and eight sets of oral health behavior followed by intraoral examinations. Clinical examinations were done by type III clinical examinations under sufficient daylight and head lamp using plane mouth mirror and community periodontal index (CPI) probe as recommended by World Health Organization (WHO) basic oral health survey method 2013 by two trained calibrated examiner.[7]

Dental caries was recorded using Decayed Missing and Filled teeth index (DMFT) for permanent teeth whereas decayed missing and filled teeth (dmft) for primary teeth which is universally accepted. Gingival Index was recorded according to Loe and Sillness[8] and Calculus Score Index as given by Greene and Vermillion.[9] Permanent molar relationship was also recorded using Angle's Classification of Malocclusion.

Dietary habits were assessed with interview from head of monastery, since all the students were served same food chart or menu accordingly. Individual schedule visit was managed with permission from the concerned authorities accordingly. Data collection was followed by oral health education and emergency treatment to the needy ones with referral to dental hospital for tertiary treatment.

Sample Size and Statistical Analysis:

Sample Size was determined based on formula $N= 4PQ/L^2$ where P is prevalence from Khanapure S et al [15] taken as 88%, Q is 1-P and L is permissible error. The total sample size determined was 163 with 95% confidence level and 5% margin of error.

The recorded data were transferred into excel sheet and analyzed using IBM SPSS statistic version 25. Descriptive statistics were performed, normality testing was done using Kolmogorov- Smirnov (KS) test. Data showed skewed distribution, hence Mann Whitney U test was employed for comparison of mean values and co-relation was done using spearman's correlation test.

RESULTS

Demographic Characteristics: The present study was conducted among 422 monks and nuns age ranging from 6 to 20 years old. Age group were further dichotomized into less and more than 12 years where 229 (54.3%) were in the age group of ≤12 years old. Studies were done in six different monasteries which were further subdivided into rural and urban monasteries according to location (Table 1).

Oral health knowledge, attitude and practice (KAP): KAP was evaluated among all the participants (Table 2). In the Knowledge domain, majority 378 (89.6%) of the participants knew that sugary food can lead to dental caries however the knowledge about fluorides or the beneficial effects of fluoridated toothpaste were largely unknown by the participants 282 (66.8%).

The attitude towards oral health was mostly positive among the monks, as 358 (84.8%) of them said that brushing before bed is a positive habit and 316 (74.9%) believed that dental caries can also hamper esthetics of an individual. However, 184 (43.6%) of the students did know about the adverse impact of carbonated beverages on oral health.

The oral hygiene practice domain showed some interesting results where 226 (53.6%) of the individuals brushed twice daily but 68 (16.1%) did not brush even once daily,

Table 1. Demographic Distribution.

		n= 422
Age (N, %) (6-20)	≤ 12 years old	229 (54.3)
	>12 years old	193 (45.7)
Gender (N, %)	Male	316 (74.9)
	Female	106 (25.1)
Place/ Institute (N, %)	Sherminub Institute for Buddhist studies, Raniban	144 (34.1)
	Kagyu Institute of Buddhist studies (KIBS) Kirtipur	29 (6.9)
	Dhubgyu Chorkhorling Monastery, Matepani	37 (8.8)
	Jangchub Choeling Monastery Pokhara	40 (9.5)
	Dhagposheydrupling Monastery, Nala, Kavre	96 (22.7)
	Tsungon Nangkyi (Nagi) Gumba, Shivapuri, Kathmandu	76 (18)

Table 2. Oral health related Knowledge, Attitude and Practice (KAP).

Knowledge on oral health (n=422)	Yes (N, %)	No (N, %)	Don't know (N, %)	Not recorded (N, %)
Do you know sugary food can cause dental caries?	378 (89.6)	13 (3.1)	31 (7.3)	
Do you know about Fluoride in dentistry?	14 (3.3)	127 (30.1)	281 (66.6)	
We should brush our teeth with Fluoridated toothpaste?	110 (26.1)	29 (6.9)	282 (66.8)	
Oral health attitude				
Sugary foods are harmful for my teeth.	367 (87)	15 (3.6)	33 (7.8)	7 (1.7)
Cold drinks (coke, cider) can damage my teeth.	229 954.3)	67 (15.9)	117 (27.7)	9 (2.1)
Brushing teeth before bed is good for our health.	358 (84.8)	12 (2.8)	41 (9.7)	11 (2.6)
Dental caries can make my looks bad.	316 (74.9)	41 (9.7)	54 (12.8)	11 (2.6)
Oral health practice	**Yes (N, %)**	**No (N, %)**	**(N=422)**	**(N, %)**
How many times do you brush your teeth?			Less than once daily	68 (16.1)
			Once daily	110 (26.1)
			Twice daily or more	226 (53.6)
Do you have your own tooth brush?	356 (84.4)	66 (15.7)		
How do you brush your teeth?			Toothpaste and brush	370 (87.7)
			Others	52 (12.3)
Do you use dental floss?	26 (6.2)	396 (93.8)		
How often do you eat sugary food?			Very less often	234 (55.5)
			Average once daily	79 (18.7)
			More than once daily	97 (23)
Do you have any dental pain recently within 6 months?	98 (23.2)	323 (76.5)		
Have you ever visited dental clinic or hospital?	148 (35.1)	274 (64.9)	**Reason to visit**	
			Emergency	43 (29.05)
			Dental pain	55 (37.16)
			Extraction	40 (27.02)
			Others	9 (6.08)

66 (15.7%) did not even have their own toothbrush. Sugary food consumption more than once a day was also quite high 97 (23%). Most of them 396 (93.8 %) never used dental floss. Dental pain in the last 6 months were observed among 98 (23.2%) of the students where the most common causes for dental visit were dental pain 55 (37.16%) followed by emergency care 43 (29.03%) and extraction 40 (27.02%).

Among them, 69% and 23% had class I and class III molar relation (Angle's classification) status and interestingly very few of the monks and nuns were aware of orthodontic treatment but none of them had experienced orthodontic treatment before (Table 3). Whereas 196 (46.4%) students had decayed permanent tooth with mean DMFT score 1.62 ± 2.19 ranging from 0-13 and mean dmft were 0.59 ± 1.4 score ranging from 0-12 with mean gingival score of 0.6 ± 5.1 and calculus score 0.29 ± 0.6 (Table 4). Only 12 (3.1%) of them had missing permanent teeth and 47 (11.1%) of them had at least one filled permanent teeth.

Dental caries status (DMFT) was observed to be significantly higher in age group >12 years as compared to <12 years (2.33 ± 2.45 v 1.01 ± 1.59; p= 0.00) (Table 5). Dental caries showed an increasing trend with age with significant moderate correlation (r=0.35, p<0.05) (Table 6). Location did not show any significant differences across various parameters.

Table 3. Molar relation and orthodontic treatment.

Angle's Molar Relation N=278 (N, %)			Previous Orthodontic treatment N=422 (N, %)	
Class	Right molar relation	Left molar relation	Yes	No
1	194 (69.7)	190 (68.3)	0	422 (100)
2	21 (7.5)	22 (7.9)		
3	63 (22.6)	65 (23.4)		

Table 4. Mean caries experience and gingival disease.

N (422)	N %	mean + SD (Range)
dmft	90 (21.3)	0.59 ± 1.4 (0-12)
DMFT	214 (50.7)	1.62 ± 2.19 (0-13)
Gingival Index	331 (78.4)	0.6 ± 5.1 (0-2.75)
Calculus Score	99 (23.5)	0.29 ± 0.6 (0-9)

Table 5. Mean Dental Caries and Gingival Health status based on age and location.

N (422)		N %	dmft		DMFT		GS		CS	
			mean ± SD	P value	mean ± SD	P value	mean ± SD	P value	mean ± SD	P value
Age	<12	229 (54.3)	0.93 ± 1.7	0	1.01 ± 1.59	0	0.61 ± 0.49	0.461	0.25 ± 0.69	0.01
	>12	193 (45.7)	0.17 ± 0.75		2.33 ± 2.45		0.59 ± 0.52		0.33 ± 0.43	
Location	Urban	249 (59)	0.65 ± 1.51	0.12	1.52 ± 2.13	0.13	0.61 ± 0.55	0.76	0.22 ± 0.61	<0.01
	Rural	173 (40.9)	0.49 ± 1.25		1.76 ± 2.13		0.58 ± 0.44		0.38 ± 0.58	

Mann-Whitney test

Table 4. Mean caries experience and gingival disease.

N 422		dmf	DMF	Gingival Score	Calculus Score
Age 6-20	Correlation coefficient	-0.453**	0.348**	0.021	0.215**
	Sig.(2-tailed)	<0.001	<0.001	0.67	<0.001

Spearman correlation

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

DISCUSSION

The basic purpose of this study was to know the oral hygiene status and highlight the treatment needs among monk and nun students in Nepal. Only few of the monasteries in Nepal are facilitated with basic primary health care service with visiting doctors or routine specialist visit or medical camps. Few of them are well equipped medical service with laboratories and some are run under international sponsor or donation.[10] Karmapa health care project (KHCP),[11] a nonprofit charitable association founded in 2005, had been actively providing voluntary specialized health care service in sixteen different monasteries, nunneries, orphanages and schools in Nepal in collaboration with Dhulikhel Hospital since 2012.

The Oral health knowledge attitude and behavior among monks and nuns were good as compared to other students from government schools of Nepal with same age groups.[12-14] Dental caries prevalence in permanent dentition seems more as compared to Lee et al[14] and similar with Shakya et al,[12] this might be due to lack of regular oral practices, education and dental service provision. Another study done among monks and nuns by Khanapureet al[15] showed very high caries prevalence (89%) with mean DMFT 6.06 with emergency treatment need. In this study dental caries increased in trend with age ($p<0.05$) which might be due to religious behavior and practices, also supports another study in similar age group.[13] Most of them had untreated dental caries or had never visited dentist, which shows poor dental service provision in developing countries like Nepal. This focuses on demanding more dental service provision.

Brushing habits are well adopted by them in this study because all student's brushed together compulsorily in the morning after praying and at night before going to bed. Monks and nuns spend praying around 3 to 6 hours in a day and they attend morning pray with fasting and without brushing which might complicate daily oral hygiene practice. To improve oral and general health, tooth brushing and hand washing programs like 'FIT FOR SCHOOL'[16] seems most promising in developing countries like Nepal which plays significant role in prevention of disease demanding nationwide implementation.

Dietary Habits: On interview with head of related monasteries, all of them have strict fixed food menu with no added sugary consumptions in between meal. Occasionally sugary food is entertained only during ritual ceremonial programs (Puja) which are performed once or twice a month. 'Tsampa' is very popular among young monks and nuns. "Tsampa" is a Tibetan and Himalayan staple foodstuff, glutinous meal made from roasted flour or wheat flour usually mixed with salty Tibetan butter tea with occasional sugar.

According to ABC News reported on May 2018, because of high intake of sugary drinks Thai Buddhist monks' health were suffered, making them obese and difficulty in walking. Interestingly most of them sip sweetened drinks to boost their energy because after midday they are forbidden to eat.[17] Another study at monastery by Avdeenko et al[18] shows high sugary consumption per day and during fasting with high intake of carbohydrate food but in contrast Nepali Buddhism follows 'Vajrayana' which consume Buddhist diet that includes Veganism and Pescatarian diet which is proven key dietary plan for weight loss.[19] The relationship between carbohydrates and dental caries depends on the type of carbohydrate consumed because the cariogenic potential of a given carbohydrate is dependent on how efficiently it can be metabolized by the bacteria that ferment it.[20]

Monks in a monastery have lot of duties with limited personal time and due to lack of dental help they have lots of duties with lack of personal time. As a result, they have more decayed, extracted teeth and less filled teeth compared with other groups.[18] Several monasteries have provision of training monks with basic primary health care service[21] which could be best example to sustain with health care practice. The best way to solve dental problems in monasteries could be availability of primary level of prevention which includes health promotion and specific protection. Since all the monk and nun stay in monasteries with same daily life style, we can focus with possible preventive procedures like tooth brushing program, dietary counseling and active oral health programs.

This study is first among Buddhist Monk and nun's oral health status in Nepal as there is no recorded scientific data among these communities. The Limitation of this study is, only few randomly selected monasteries under Karmapa health care project is included which might differ from other monasteries daily health practices and also these study population could not generalize all monk and nun

students of Nepal. Thus further researches in future can be done in this community.

CONCLUSIONS

The results of present study shows prevalent dental caries with good gingival health among monk and nun students and oral health knowledge and practice were also good. Although sugary food consumption was limited in monasteries, dental pain were very common among them but unfortunately there were no dental treatment provision in the monasteries and very few of them had undergone restoration of decayed teeth with no orthodontic treatment. Oral health education along with treatment provisions needs, need to be made aware in these communities.

ACKNOWLEDGEMENTS

We would like to thank Karmapa Health Care project team for continuous support regarding healthcare to respective monasteries in collaboration with Dhulikhel Hospital, Kathmandu University School of Medical Sciences. Also, Special thanks to Monasteries teachers, Supervisor, Coordinators and senior monks for their help and cooperation's.

Conflict of Interest: None

JNAPD

REFERENCES

1. World Health Organization. Oral Health. (2021). Retrieved 20 October 2021. Available from: https://www.who.int/news-room/fact-sheets/detail/oral-health. [Link]
2. Global, regional, and national incidence, prevalence, and years lived with disability for 354 diseases and injuries for 195 countries and territories, 1990-2017: a systematic analysis for the Global Burden of Disease Study 2017. Lancet. 2018 Nov 10;392(10159):1789-1858. [PubMed | Full Text | DOI]
3. Benzian H, Garg R, Monse B, et al. Promoting Oral Health through Programs in Middle Childhood and Adolescence. In: Bundy DAP, Silva Nd, Horton S, et al., editors. Child and Adolescent Health and Development. 3rd edition. Washington (DC): The International Bank for Reconstruction and Development / The World Bank; 2017 Nov 20. Chapter 16. [PubMed | Full Text | DOI]
4. Frencken JE, Sharma P, Stenhouse L, Green D, Laverty D, Dietrich T. Global epidemiology of dental caries and severe periodontitis - a comprehensive review. J Clin Periodontol. 2017 Mar;44 Suppl 18:S94-S105. [PubMed | Full Text | DOI]
5. Karki S. Oral health status, oral health related quality of life and associated factors among Nepalese school children. 4th International Association for Dental Research Asia Pacific Regional Congress 2019, 28-30 November, Brisbane, Australia. Retrieved 20 October 2021. Available from: http://jultika.oulu.fi/files/isbn9789526223384.pdf. [Full Text]
6. Population monograph of Nepal. Volume II (Social Demography). Government of Nepal. Central bureau of Statistic.1st edition. Kathmandu: Multi Graphics press Pvt Ltd; 2014. [Full Text]
7. Petersen, Poul Erik, Baez, Ramon J &World Health Organization. (2013). Oral health surveys: basic methods, 5th ed.World Health Organization. Retrieved 20 October 2021. Available from: https://www.who.int/publications/i/item/9789241548649?__cf_chl_managed_tk__=f88Cg0a_G.KpTrxbXA1t8rsK1bWsGQwIxr-967fAbT30-1640845185-0-gaNycGzNC5E. [Full Text]
8. Löe H. The Gingival Index, the Plaque Index and the Retention Index Systems. J Periodontol. 1967 Nov-Dec;38(6):Suppl:610-6. [PubMed | Full Text | DOI]
9. GREENE JC, VERMILLION JR. THE SIMPLIFIED ORAL HYGIENE INDEX. J Am Dent Assoc. 1964 Jan;68:7-13. [PubMed | Full Text | DOI]
10. Kopan Monastery. Medical care in the Kopan clinic. Retrieved 20 October 2021. Available from: https://kopanmonastery.com/helping-kopan/medical-care. [Link]
11. Karmapa Healthcare Project. Retrieved 20 October 2021. Available from: https://www.karmapa-healthcare.org. [Link]
12. Shakya A, Shrestha M, Srivastav A, Kayastha B. Oral health related knowledge, attitude, and practice among school children of Jyamrung, Nepal. JCMC. 2015;4(3):1-4. [Full Text]
13. Prasai Dixit L, Shakya A, Shrestha M, Shrestha A. Dental caries prevalence, oral health knowledge and practice among indigenous Chepang school children of Nepal. BMC Oral Health. 2013 May 14;13:20. [PubMed | Full Text | DOI]
14. Lee HJ, Prajapati D, Jin BH. Dental caries status and related modifiable factors among Nepali students. Community Dent Health. 2019 Aug 29;36(3):207-213. [PubMed | DOI]
15. Khanapure S, Abraham A, Abokhlifa YH, Sam G, Reddy MSR, Subhash NR. Prevalence of Dental Caries and Treatment Needs in Tibetan Monks and Nuns in Karnataka. J Pharm Bioallied Sci. 2020 Aug;12(Suppl 1):S214-S217. [PubMed | DOI]
16. Duijster D, Monse B, Dimaisip-Nabuab J, Djuharnoko P, Heinrich-Weltzien R, Hobdell M, Kromeyer-Hauschild K, KunthearithY, Mijares-Majini MC, Siegmund N, Soukhanouvong P, Benzian H. 'Fit for school' - a school-based water, sanitation and hygiene programme to improve child health: Results from a longitudinal study in Cambodia, Indonesia and Lao PDR. BMC Public Health. 2017 Apr 5;17(1):302. [PubMed | DOI]
17. Liam Cochrane, Supattra Vimonsuknopparat. "Thai Buddhist monks' health suffering from sugary drinks". ABC News. 28 May 2018. Retrieved 20 October 2021. Available from: https://www.abc.net.au/news/2018-05-28/thai-buddhist-monks-health-ruined-by-sugary-drinks/9711412. [Full Text]
18. Avdeenko O, Novikova I, Turkina A, Makeeva I. Oral Behavior and Dental Status of Orthodox Christian Priests and Monks. J Int Soc Prev Community Dent. 2019 Mar-Apr;9(2):137-143. [PubMed | Full Text | DOI]
19. C. Kamau, K Fleming. "Buddhist Diet Plan For Weight Loss: Eat Like A Monk And Watch The Pounds Drop Off". Better me. May 2021. Retrieved 20 October 2021. Available from: https://betterme.world/articles/buddhist-diet/. [Full Text]
20. Sheiham A, James WP. Diet and Dental Caries: The Pivotal Role of Free Sugars Reemphasized. J Dent Res. 2015 Oct;94(10):1341-7. [PubMed | Full Text | DOI]
21. Muangman D, Hirunraks A. Knowledge, attitudes, and practices of 1,985 Buddhist monks in Thailand concerning family planning, sterilization and primary health care. J Thai Assoc Volunt Steriliz. 1983 Dec:87-90. [PubMed]