

## Acceptance to a “Sugar Free Campus” Concept in a Dental College: A Questionnaire Based Study

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### ABSTRACT

**Introduction:** Sugar is a risk factor for dental caries, obesity and various health conditions. Promoting a healthy food environment enables people to adopt and maintain healthy dietary practices. Hence, a precise and comprehensive assessment is required to assess the willingness of a dental institute towards sugar restrictions in the campus.

**Aim:** To assess the acceptance to a “sugar free campus” concept in a dental college: a questionnaire-based study.

**Methodology:** A validated 14-point questionnaire-based study tool was administered to the staff, postgraduates and undergraduates of the college in this cross-sectional study. The assessment was done using a 5-point Likert scale for each question. The questionnaire also included a section for additional comments.

**Results:** 451 eligible questionnaires were obtained (response rate: 90%). Mean score of  $45.37 \pm SD 7.567$  was obtained across the study population (N = 451). Highest score was seen in lecturers (mean  $49.39 \pm 8.176$ ) and lowest score was seen in 1<sup>st</sup> year postgraduates (mean  $41.79 \pm 7.544$ ). Highest score was seen in Pediatric Dentistry department (mean  $51.57 \pm 8.299$ ), lowest was seen in Periodontology department (mean  $38.94 \pm 7.526$ ). The most strongly agreed upon concept was availability of sugar free tea/coffee as an option in CDE programmes. The most strongly disagreed upon concept was restriction on celebrating birthdays in the institute premises.

**Conclusion:** There was a mixed acceptance to a “sugar free campus” concept with variations across departments and designations.

**Keywords:** Free sugars, Dental caries, Tobacco free campus, Upstream approach, Prevention, Health promotion

**Abbreviations:** WHO: World Health Organization; CDE: Continuing Dental Education; BDS: Bachelor of Dental Surgery; PHD: Public Health Dentistry; SSB: Sugar Sweetened Beverages; NCDs: Non-communicable diseases

### INTRODUCTION

Marmot [1] had mentioned that ‘people's lifestyles and the conditions in which they live and work strongly influence their health and longevity’. Dietary behavior is governed by the accessibility, availability, affordability and acceptability of choosing healthy food options over unhealthy ones [2]. Subsequent to the WHO sugar guidelines (2015) [3], the objective of reduction in sugar consumption necessitates an upstream approach [4]. Changing work environment has been proven as an effective strategy in curbing tobacco use initiation, second hand smoke exposure, and the social acceptability of tobacco use [5]. Several studies have observed significant reduction in smoking prevalence among university students by adoption of ‘Tobacco free campus’ concept [6,7]. Similar strategy for sugar control could be a

revolutionary idea. A dental school is an ideal environment for developing a model workplace for restriction of sugar consumption as dentists often advise sugar control.

However, no study regarding acceptability of a ‘sugar free

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campus’ in dental schools has been reported. Therefore, a study was undertaken to assess the willingness of a dental institute towards sugar restrictions in the campus.

**AIM**

The study aimed at assessing the acceptance to a “sugar free campus” concept in a dental institute.

**OBJECTIVES**

1. To assess the acceptance of the “sugar free campus” concept based on the overall score obtained
2. To assess the designation-wise acceptance to the “sugar free campus” concept
3. To assess the department-wise acceptance to the “sugar free campus” concept
4. To compare the differences in the acceptance to the “sugar free campus” concept w. r. t. the gender, designations and departments.

**MATERIALS AND METHODS**

A questionnaire-based cross-sectional study design was used for this study. Necessary clearances were obtained from the Institutional Review Board and Institutional Ethics Committee, prior to beginning of the study. Required

permission was taken from the dean and a written consent was obtained from each participant. The study was conducted in a private dental institute in an urban area (Dr. G. D. Pol’s Foundation Y.M.T. Dental College and Hospital, Kharghar, Navi Mumbai). The sample comprised of approximately 80 dental staff members, 95 postgraduates and 400 undergraduates including the interns. The first-year undergraduates were excluded as their term had not started. The study was conducted during the period: 2<sup>nd</sup> August to 10<sup>th</sup> August, 2018.

**Study tool**

This being a novel study, a study tool comprising of 14-point questionnaire (**Figure 1**) was developed. The questionnaire was piloted in a different school and also validated by an expert. Since the dental curriculum in this institution follows the English language, information sheet, consent form and questionnaire were provided in the English language only. The tools were physically distributed to about 500 participants in the entire college. A personal reminder was given after 5 days to participants who had not filled the questionnaire. We managed to collect 451 questionnaires at the end of the study.

**QUESTIONNAIRE**

NAME(OPTIONAL)	SEX	STAFF DESIGNATION	PG				UG				DEPARTMENT		
			1	2	3	4	1	2	3	4		INTERN	

This study is undertaken to assess feasibility of controlling sugar consumption in dental institutes. (Please tick one option only. Kindly answer all questions.)

1. Do you think that implementation of WHO\* recommendation of sugar consumption requires a united community effort?  
\*The current WHO Sugar Guideline (2015) recommends adults and children reduce their daily intake of free sugars to less than 10% of their total energy intake. A further reduction to below 5% or roughly 25 grams (5 teaspoons) per day would provide additional health benefits.  
Completely disagree  Somewhat disagree  Neutral  Somewhat agree  Completely agree
2. Do you feel that reducing the consumption of sugar rich processed foods is necessary for good health?  
Completely disagree  Somewhat disagree  Neutral  Somewhat agree  Completely agree
3. Do you think that ready availability of sugar-rich processed foods is an important factor in consuming them?  
Completely disagree  Somewhat disagree  Neutral  Somewhat agree  Completely agree
4. Do you think you are compelled to consume a sweet when it is offered to you?  
Completely disagree  Somewhat disagree  Neutral  Somewhat agree  Completely agree
5. Do you think a work environmental change (similar to Tobacco free campus) is necessary to reduce sugar consumption?  
Completely disagree  Somewhat disagree  Neutral  Somewhat agree  Completely agree
6. Do you think that distributing sweets (e.g. chocolates, Indian sweets) on specific occasion (birthday, examination results) needs to be restricted?  
Completely disagree  Somewhat disagree  Neutral  Somewhat agree  Completely agree
7. Do you think cutting cakes on birthdays needs to be restricted in the institute premises?  
Completely disagree  Somewhat disagree  Neutral  Somewhat agree  Completely agree
8. Do you think that tea/coffee without sugar should be available as an option at all meetings (CDE programmes, for example)?  
Completely disagree  Somewhat disagree  Neutral  Somewhat agree  Completely agree
9. Do you think sugar sweetened beverages should not be served by the canteen?  
Completely disagree  Somewhat disagree  Neutral  Somewhat agree  Completely agree
10. Do you think college magazines should not include promotional advertisements of sugar-rich foods?  
Completely disagree  Somewhat disagree  Neutral  Somewhat agree  Completely agree
11. Do you think a dental college should not accept sponsorships from sugar sweetened beverage manufacturers for college events?  
Completely disagree  Somewhat disagree  Neutral  Somewhat agree  Completely agree
12. Do you think controlling sugar in a campus will send an educational message to people at large?  
Completely disagree  Somewhat disagree  Neutral  Somewhat agree  Completely agree
13. Do you think that dentists can take a leadership responsibility for the campaign against free sugars?  
Completely disagree  Somewhat disagree  Neutral  Somewhat agree  Completely agree
14. Can you make three recommendations to decrease sugar consumption in the college campus?( As per priority)  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Additional comments (if any):  
\_\_\_\_\_  
\_\_\_\_\_

**Figure 1.** Questionnaire given to every participant.

**Data sources/ measurement**

The assessment was done using a 5-point Likert scale ranging from completely disagree (scored as 1) to completely agree (scored as 5). The level of acceptance was measured in terms of total score out of the maximum (65) as a quantitative continuous variable. The questionnaire also included one open ended question “Can you make three recommendations to decrease sugar consumption in the college campus? (Write in the order of preference)” to judge the attitude of the participants qualitatively. The questionnaire also included a section for additional comments which was optional. The modifying factors considered in the study were gender, designation and department to which the participant belonged.

**RESULTS**

Data obtained were compiled on a MS Office Excel Sheet (2013) and subjected to statistical analysis using Statistical Package for Social Sciences (SPSS v 21.0, IBM). Data were not normally distributed and non-parametric tests were used. For all the statistical tests, significance level of 0.05 was chosen (p<0.05).

The characteristics of the study population in terms of their gender, designation and department are shown in **Table 1**. Out of the entire study population, seventy five percent were females. There were eleven designations and nine departments. The distribution is shown both in frequencies and percentages.

451 eligible questionnaires were obtained (response rate= 90%). The minimum possible score was 13 and maximum possible score was 65. Mean score of 45.37 (± 7.567) was obtained in the study population (N = 451). **Table 2** depicts the overall percentage of various responses to all questions. 80% of the study population agreed that a reduction in consumption of sugar rich processed foods is necessary for good health. 80% of the study population also agreed to availability of sugar free tea/coffee options at conferences etc., in the college campus. 63% and 53% of the study population disagreed on restriction on cake cutting for birthdays and distribution of sweets on special occasions, respectively.

Comparison of the mean score (out of 65) was done with respect to gender, designation and department using the t-test and f-test. Statistically non-significant difference was seen w. r. t. the gender but significant differences were seen for different designations and departments (**Tables 3-7**). Highest score was seen with lecturers and lowest was seen with 1<sup>st</sup> year postgraduates. There was a higher acceptability of this concept with respect to Pediatric Dentistry and Public Health Dentistry departments as compared to the Periodontology and Orthodontics departments. Designation-wise and department-wise, both, we found statistically significant differences in the responses to certain set of

questions. Based on the various responses we could summarize the most commonly agreed and disagreed concepts as stated in **Table 8**.

**Table 1.** Characteristics of the study population.

Variable	Categories	Frequency	Percentage
Gender	Female	340	75.4
	Male	111	24.6
Designation	Professor	9	2.0
	Reader	17	3.8
	Lecturer	18	4.0
	Other staff*	14	3.1
	3rd year postgraduate	26	5.8
	2nd year postgraduate	26	5.8
	1st year postgraduate	28	6.2
	Interns	96	21.3
	Final BDS	70	15.5
	3rd year BDS	70	15.5
	2nd year BDS	77	17.1
Department	Pediatric Dentistry	14	3.1
	Orthodontics	19	4.2
	Public Health Dentistry (PHD)	4	.9
	Oral Pathology	13	2.9
	Conservative Dentistry & Endodontics	20	4.4
	Prosthodontics	18	4.0
	Oral Medicine Diagnosis and Radiology	17	3.8
	Oral Surgery	15	3.3
	Periodontology	18	4.0

N=451\*other staff - Tutors, Clinical Assistants

**Table 2.** Responses to all questions.

Questions	Responses	Percent
Do you think that implementation of WHO* recommendation of sugar consumption requires a united community effort?	Completely disagree	1.6
	Somewhat disagree	3.3
	Neutral	12.4
	Somewhat agree	37.9
	Completely agree	44.8
Do you feel that reducing the consumption of sugar rich processed foods is necessary for good health?	Completely disagree	5.1
	Somewhat disagree	4.0
	Neutral	6.4
	Somewhat agree	30.4
	Completely agree	54.1
Do you think that ready availability of sugar-rich processed foods is an important factor in consuming them?	Completely disagree	7.1
	Somewhat disagree	10.9
	Neutral	15.3
	Somewhat agree	31.9
	Completely agree	34.8
Do you think you are compelled to consume a sweet when it is offered to you?	Completely disagree	16.6
	Somewhat disagree	17.3
	Neutral	17.7
	Somewhat agree	29.7
	Completely agree	18.6
Do you think a work environmental change (similar to Tobacco free campus) is necessary to reduce sugar consumption?	Completely disagree	7.1
	Somewhat disagree	12.4
	Neutral	17.7
	Somewhat agree	36.4
	Completely agree	26.4
Do you think that distributing sweets (e.g., chocolates, Indian sweets) on specific occasion (birthday, examination results) needs to be restricted?	Completely disagree	27.9
	Somewhat disagree	25.9
	Neutral	19.1
	Somewhat agree	17.7
	Completely agree	9.3
Do you think cutting cakes on birthdays needs to be restricted in the institute premises?	Completely disagree	40.1
	Somewhat disagree	23.5
	Neutral	15.3
	Completely agree	8.9

Do you think that tea/coffee without sugar should be available as an option at all meetings (CDE programmes, for example)?	Completely disagree	4.0
	Somewhat disagree	7.1
	Neutral	8.4
	Somewhat agree	23.1
	Completely agree	57.4
Do you think sugar sweetened beverages should not be served by the canteen?	Completely disagree	25.3
	Somewhat disagree	24.8
	Neutral	20.8
	Somewhat agree	19.1
	Completely agree	10.0
Do you think college magazines should not include promotional advertisements of sugar-rich foods?	Completely disagree	8.9
	Somewhat disagree	17.3
	Neutral	22.0
	Somewhat agree	29.0
	Completely agree	22.8
Do you think a dental college should not accept sponsorships from sugar sweetened beverage manufacturers for college events?	Completely disagree	11.5
	Somewhat disagree	19.1
	Neutral	25.3
	Somewhat agree	21.5
	Completely agree	22.6
Do you think controlling sugar in a campus will send an educational message to people at large?	Completely disagree	4.4
	Somewhat disagree	10.6
	Neutral	14.2
	Somewhat agree	38.6
	Completely agree	32.2
Do you think that dentists can take a leadership responsibility for the campaign against free sugars?	Completely disagree	2.2
	Somewhat disagree	1.6
	Neutral	12.2
	Somewhat agree	38.1
	Completely agree	45.9

**Table 3.** Gender-wise comparison of total score (out of 65).

Gender	N	Mean score (Out of total 65)	Std. Deviation	Std. Error Mean	t value	p value
Female	339	45.28	7.421	.403	-0.618	0.537#
Male	111	45.79	7.914	.751		

(#not significant)

**Table 4.** Designation-wise comparison of total score (out of 65).

Designation	Subjects	Mean	Std. Deviation	Std. Error	F	p value
Professor	9	45.00	14.983	4.994	2.156	.020*
Reader	17	47.71	6.478	1.571		
Lecturer	18	49.39	8.176	1.927		
Other staff*	14	48.21	7.536	2.014		
3 <sup>rd</sup> year postgraduate	26	43.27	7.513	1.473		
2 <sup>nd</sup> year postgraduate	26	47.46	5.907	1.159		
1 <sup>st</sup> year postgraduate	28	41.79	7.544	1.426		
Intern	96	45.52	7.774	.793		
Final BDS	70	46.04	7.586	.907		
3rd year BDS	70	44.83	6.474	.774		
2nd year BDS	77	44.47	7.065	.805		
Total	451	45.37	7.567	.356		

(\* Significant)

**Table 5.** Department-wise comparison of total score (out of 65).

Designation	Subjects	Mean	Std. Deviation	Std. Error	F	p value
Pediatric Dentistry	14	51.57	8.299	2.218	3.328	.002**
Orthodontics	19	44.26	6.539	1.500		
Public Health Dentistry (PHD)	4	51.25	5.439	2.720		
Oral Pathology	13	46.15	6.581	1.825		
Conservative Dentistry & Endodontics	20	45.60	8.810	1.970		
Prosthodontics	18	47.56	10.354	2.440		
Oral Medicine Diagnosis and Radiology	17	44.88	5.510	1.336		
Oral Surgery	15	47.27	6.724	1.736		
Periodontology	18	38.94	7.526	1.774		
Total	138	45.72	8.209	.699		

(\* Significant)

**Table 6.** Designation-wise comparison of each response.

	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q13
$\chi^2$ value	21.12	30.66	43.82	20.71	12.69	18.98	24.20	7.60	22.21	30.79	13.01	14.12	16.66
P value	.020	.001	.000	.023	.241	.040	.007	.668	.014	.001	.223	.168	.082

**Table 7.** Department-wise comparison of each response.

	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q13
$\chi^2$ value	7.83	9.28	2.40	6.93	9.40	20.30	15.55	12.37	21.25	31.89	31.55	10.21	8.78
P value	.450	.319	.966	.543	.309	.009	.049	.135	.007	.000	.000	.250	.361

**Table 8.** Most commonly agreed and disagreed concepts.

Agreed	Disagreed
Availability of sugar free refreshments during conferences, CDE programmes	Not distributing sweets for celebration
Restriction on College magazines w. r. t. promotional advertisements for Sugar Sweetened Beverages (SSB)	Not cutting cakes on birthdays
Restriction on Sponsorship from SSB manufacturers for college events	Restriction on availability of SSB in canteen

Overall, there was a significant difference between the responses given by staff, postgraduate and undergraduate students. A greater acceptance of the concept was shown by the staff when compared to postgraduate and undergraduate students.

With regards to open ended questions, we came across interesting concepts which were noteworthy. The participants suggested putting up educational posters and conducting educational seminars in the campus regarding the ill-effects of free sugar; celebrating birthdays on a common day and following a “no sugar day” in the campus.

**DISCUSSION**

As many as 3.5 billion people are affected by oral diseases globally [8]. Untreated dental caries is the most prevalent health condition globally affecting all age groups and is governed by its chronic progressive and cumulative pattern causing pain, discomfort, economic burden and negative impact on oral health quality of life. [9,10]. Obesity similar to dental caries is largely preventable but has now become a serious health concern of the 21<sup>st</sup> century. Free sugar consumption, tobacco use, and harmful alcohol consumption, as well as the wider social and commercial determinants of health are the common risk factors of oral conditions and other non-communicable diseases (NCDs) [11].

Over the past 50 years, worldwide sugar consumption has tripled and is expected to grow [12]. Several corporate, social and cultural practices have led to a belief that sugar is a source of harmless pleasure [12,13]. However, enough evidence already exists that free sugar, similar to tobacco, is toxic and contributes to the global burden of NCDs [14]. Amplifying global advocacy on reduction of free sugar consumption is now a mainstream health priority [15]. Dentists advocate healthy dietary practices to their patients. However, in addition to such simple, individualistic and educational approaches, an upstream health promotional approach is the need of the hour.

A dental college can be an ideal model for health behavior change w. r. t. sugar reduction. It is important to understand the attitude of dental staff and students towards free sugar consumption as these individuals are the oral health ambassadors. Since dentists can take a leadership responsibility in a campaign against free sugars, we conducted this research - one of its kinds, in a dental campus to assess the acceptance to "sugar free campus" using a questionnaire.

In our study, we found that staff and students were aware of the ill effects of sugar but that did not translate into readiness for a "sugar free campus". This could possibly be because the human brain adores the "status quo" [16]. Changing behavior is extremely difficult and having people accepted to radical change is complex [17]. However, we could find a changing trend in some departments. The higher acceptance of Pediatric Dentistry and Public Health Dentistry departments towards this concept could be because these specializations focus more on prevention and health promotion compared to Periodontology, Conservative Dentistry and Endodontics departments, which indulge more in treatment interventions. Overall, greater acceptance to the concept was seen by the teaching staff as compared to postgraduate and undergraduate students. We found that amongst different designations, lecturers had the highest acceptance to the concept which could be attributed to their increased involvement in conducting dental camps (educational), greater interaction with the patients and conducting lectures for undergraduates. The fresh batches of postgraduates and undergraduates had the least acceptance probably because they may lack the understanding of the implications of free sugars on health.

Food industry, through its various marketing strategies, sponsorships of various conferences, etc., has a profound influence on people's food choices, purchases and consumption patterns [18]. Restriction on sponsorships for college events and advertisements in college magazine could be necessary. By adopting a "sugar free campus" concept, dental schools can influence their patients and visitors to adopt and maintain healthy dietary practices. It is stated that "physicians who practice healthy lifestyle norms are more likely to convince and benefit their patients to follow the

same" [19]. Dentists can thus 'lead by example' for the reduction of sugar consumption.

### OUR STUDY HAS FOLLOWING LIMITATIONS

This being a preliminary investigation a convenient sample from only one institute was chosen. The group sizes were not equal (undergraduates were more in number as compared to staff and postgraduates; and professors were much fewer than lecturers as is seen in any teaching institute). Moreover, the teaching practices, campus restrictions, social and cultural practices, food availability, etc. vary from place to place and thus, this study has limited generalizability. However, this being the first study of its kind, has made important observations and generated important hypotheses to be tested.

### CONCLUSIONS

There was a mixed acceptance to a "sugar free campus" concept. Significant variations to the concept were seen w. r. t. designations and departments but not w. r. t. gender. Pediatric Dentistry and Public Health Dentistry showed highest acceptance whereas Department of Periodontology showed the least acceptance towards the "sugar free campus" concept. Teaching staff showed higher acceptance compared to students.

A multicentric study with a larger sample can substantiate the claims made by our study. Furthermore, studies assessing the knowledge and behaviors of staff and students of dental schools in addition to the attitude towards the "sugar free campus" concept are necessary. A stepwise implementation of "sugar free campus" will bring in an environmental change that is much necessary for the prevention of NCDs and dental conditions.

### DISCLAIMER

The authors declare no conflict of interest. This study was self-funded.

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