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## Original Research Article

## Oral health knowledge and oral health behavior among first-year undergraduates of the University of Peradeniya, Sri Lanka

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## ABSTRACT

This study aimed to determine oral health knowledge and practices among first-year undergraduates of the University of Peradeniya, Sri Lanka, and to compare the same among students of the health related (HRF) and non-health-related (NHRF) faculties. Data was collected from 504 students across eight faculties using an online questionnaire prior to commencing discipline-based academic programs. Mean scores for oral health knowledge and practices were  $62.56 \pm 10.68$  and  $71.89 \pm 15.4$ , respectively. HRF students showed significantly higher scores for both parameters than NHRF students. Oral health knowledge was associated positively with age, parental education and female gender. Unsatisfactory knowledge scores were observed regarding inter-dental cleaning aids and awareness of oral health toward systemic health. The results revealed, undergraduates exposed to health-related subjects in their school career had better oral health knowledge and practices. Thus, incorporation of health studies for all students in school curricula is important. The level of knowledge and practices could be lower among young adults in the general population as the study sample consisted of only the highest achievers among the young adults. Therefore, oral health education programs are recommended to address knowledge deficits, increase awareness of interdental cleaning and the influence of oral health on systemic diseases.

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## 1. Introduction

Oral health is an integral component of general health. Sound knowledge of oral health is a prerequisite for maintaining acceptable oral health behavior.<sup>1</sup>

The importance of health literacy among young adults is widely acknowledged as they are the pioneers in the future workforce. Further, they may become parents in the near

future and would be required to care for their offspring. Poor oral health knowledge among the young population has been reported in many countries even among literates.<sup>1,2</sup> There are limited studies conducted among young adults aged 21-25 years in Sri Lanka unlike the school children as they are included in all published national oral health surveys. The oral health status of first-year dental students was studied in Sri Lanka a few decades ago and reported 46% and 40.9% of the students required treatment for caries and periodontal diseases respectively.<sup>3</sup>

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The university students could be considered as the most educated cohort of this age group (21-25 years) since only the higher academic performers at university entrance examinations like A/L (Advanced Level) enter state universities. Students studying healthcare related professional courses like dentistry are future role models and leaders of our society.<sup>4</sup> Therefore, their level of knowledge could reflect that of the rest of the similar-age students in society.

The aim of this study was to determine the oral health knowledge and oral health behaviors among first year undergraduates at the University of Peradeniya, Sri Lanka. This group have studied different subject streams for their GCE A/L in schools. The findings of this study are useful to identify the gaps in oral health knowledge and practices among 21–25-year group to plan and implement oral health educational programs and strategies tailored to this young population.

## 2. Method and Study Population

A cross-sectional study was carried out among the first-year university undergraduates of eight faculties during the academic year of 2020/2021 prior to commencing their respective academic courses. Therefore, possible confounding effects due to subject specific course contents was removed. During the research study period, students were at home following the orientation program because of COVID pandemic. Sample size was calculated based on the proportion of dental caries of first year dental students reported previously which is 46%. ( $N = p(1-p)z^2/l^2$   $z$ =standard normal deviate value  $l$ =level of precision 0.05 confidence level=1.96). After considering the 5% non-response rate, the minimum sample size was 400.

Data were collected using an online questionnaire made based on the previous studies. The content of the questionnaire included statements which evaluate knowledge on risk factors of dental caries, periodontal diseases, oral cancer and tooth malalignment. The questions on oral health practices included evaluating brushing, dietary habits and dental visits. In addition, socio-demographic information (faculty, age, ethnicity, hometown and parent's education level) was included. The questionnaire was pre-tested on randomly selected sample of first year students at another university and improved based on the results. Multiple choice questions were used to assess oral health knowledge. Ethical clearance was obtained from the Ethics Review Committee of the Faculty of Dental Sciences, Peradeniya.

### 2.1. Statistical analysis

The data entry and analysis performed using SPSS-21 Statistical Software Package. Total scores were computed based on the responses provided by first year undergraduates

comparing health related and non-health related faculties. Medical (n=33, Dental (n=13), Veterinary (n=21), Allied Health Sciences (n=90) were included in the health-related faculties (HRF) while Science (n=90), Engineering (n=94), Arts (n=139), Management (n=24) were considered as faculties of non-health stream (NHRF). Scores were calculated for assessing the oral health knowledge and practices considering the correct responses. Comparisons of scores between students of HRF and NHRF were made using Mann Whitney U-test. Both Mann Whitney U-test and Kruskal Wallis test was used to detect any relationship between socio-demographic profile and oral health knowledge and practices.

## 3. Results

Among 700 students, only 504 students responded to the online questionnaire and the response rate was 72%. The socio-demographic profile of the study group is shown in the Table 1. The age range was 21-24 years and a more significant proportion of the sample included female (64.29%) students.

### 3.1. Oral health knowledge and oral health practices

The mean score and the median for oral health knowledge among students were  $62.56 \pm 10.68$  and 60 respectively. When scores were calculated using correct responses for oral health practices a higher mean score ( $71.89 \pm 15.4$ ) and median (75) were noted than that of knowledge score. Statistically significant higher scores were observed for both overall oral health knowledge and oral health practices among students of HRF compared to those of NHRF (Table 2). Similarly, a greater score was noticed for plaque control measures among students of HRF. However, these differences were insignificant when scores were calculated individually e.g. Knowledge on dental caries, oral cancer and malalignment (Table 2).

Among all students, 66.12% were aware that poor gum health has close connection with systemic diseases such as diabetes. Furthermore, most students cleaned their teeth at least twice a day (77.57%) and the tongue during toothbrushing (89.48%). However, only 21.42% of students used interdental cleaning aids. Furthermore, 51.78% and 35.91% of students consumed at least one soft drink and one sweet daily respectively.

### 3.2. Associated factors

Mann Whitney and Kruskal Walls tests showed significant differences in the scores of oral health knowledge and practices among undergraduates according to some of the socio-demographic factors (Table 1). A significant variation was noted on the scores of the oral health knowledge and practices according to the gender and parents' education. Students of more educated parents

**Table 1:** Socio demographic characteristics of the students and their association with the scores of oral health knowledge and practices (HR; Health related, NHR: non-health related)

Sociodemographic factors	HRF	NHRF	Oral Health Knowledge score			Oral health practices score		
			Mean	Median	p-value	Mean	Median	p-value
Age								
21-22	114(31.2%)	251(68.8%)	61.7	60	0.008273	71.9	75	0.7377
23-24	43 (30.9%)	96 (69.1%)	64.8	66.7		71.7	75	
Gender								
1-Female	116(35.8%)	208(64.2%)	63.4	60	0.03258	74.6	75	0.000
2-Male	41(22.8%)	139(77.2%)	61.0	60		66.9	62.5	
Ethnicity								
1-Sinhala	139(29.4%)	334(70.6%)	62.4	60	0.3686	72.1	75	0.6738
2-Tamil	12(75%)	4(25%)	66.2	66.7		70	62.5	
3-Muslim	6(40%)	9(60%)	63.1	66.7		67.3	75	
Hometown								
1-Urban	28(43.8%)	36(56.2%)	61.5	60	0.5169	74.6	75	0.3055
2-Semi urban	71(31.3%)	156(68.7%)	63.2	60		71.5	75	
3-Rural	58(27.2%)	155(72.8%)	62.1	60		71.5	75	
Father's Education								
1-up to Grade 5 or less	12(27.9%)	31(72.1%)	58.6	60	0.001518	71.3	75	0.569
2-up to GCE O/L	59(32.1%)	125(67.9%)	62.6	60		72.9	75	
3-up to GCE A/L	51(29.1%)	124(70.9%)	61.8	60		70.9	75	
4-Degree/Diploma	51(43.2%)	67(56.8%)	65.6	66.7		72	75	
Mother's Education								
1-up to Grade 5 or less	8(34.8%)	15(65.2%)	60.6	60	0.01454	72	75	0.7075
2-up to GCE O/L	62(34.1%)	120(65.9%)	62.3	60		71.8	75	
3-up to GCE A/L	51(28.3%)	129(71.7%)	61.2	60		71	75	
4-Degree/Diploma	51(38.1%)	83(61.9%)	65.4	66.7		73.3	75	

**Table 2:** Scores of oral health knowledge and health practices among students of health related (HRF) faculties and non-health related (NHRF) faculties

		HRF			NHRF		p-value	Significance
		Mean ±SD	median		Mean ±SD	Median		
Knowledge of dental caries	154	53.9 ±14.3	50	331	52.6 ±14.1	50	0.3298	Not significant
Knowledge of gum diseases	151	73 ±17.0	80	326	70.3 ±16.2	80	0.04489	Significant
Knowledge of oral cancer	155	82.9 ±28.2	100	335	82.2 ±30.3	100	0.9507	Not significant
Knowledge of malalignment	155	66.5 ±47.4	100	335	64.2± 48.0	100	0.6247	Not significant
Total score for overall oral health knowledge	155	64.3 ±11.5	66.7	335	61.7± 10.2	60.0	0.006108	Significant
Score for oral health practices	153	75.1 ±14.3	75	341	70.5 ±15.7	75	0.000685	Significant
Score on plaque control measures	148	74.9± 15.8	80	321	70.8 ±19.0	80	0.01556	Significant

indicated a greater knowledge score than their counterparts whose parents had low educational attainment ( $p < 0.01$ ). One tailed Wilcoxon test showed that female first-year undergraduates obtained significantly higher scores than male undergraduates pertaining to oral health knowledge, health practices and plaque control measures ( $P < 0.001$ ). Although all students were from the same batch, two age categories were identified; 21 to 22 and 23 to 24. The older undergraduates showed significantly greater scores than their younger counterpart in relation to oral health knowledge (Table 1). However, there were no differences in the scores of oral health practices and plaque control measures among the two age groups.

#### 4. Discussion

This study aimed to determine the oral health knowledge and oral health related behaviors among first year undergraduates of the University of Peradeniya. Although all the undergraduates of the first year entered the university on the same year, two age categories were identified since some students entered the university by their second or third attempt of the entrance (A/L) examination. The students of university of Peradeniya represent almost all socioeconomic strata in Sri Lanka and they are recruited from all 25 administrative districts in the country. These students could be considered as the most educated cohort of this age group (21-25 year) since 10-15% students who scored highest Z score at GCE A/L examination are selected for state universities in Sri Lanka. Furthermore, a very high score is necessary to enter the University of Peradeniya among other 15 state universities in Sri Lanka.

The observation of significantly greater scores for oral health knowledge and the oral hygiene practices among HRF undergraduates than those from NHRF was in accordance with the findings of similar studies conducted in India and Nigeria.<sup>1,5</sup> Most of these studies have used undergraduates across several academic years compared to present study which used only first year students. As data was collected before commencement of academic activities, it was assumed that the students would have gained oral health knowledge before entering the university. The students in HRF intend to engage in health-related professions in future, hence could have studied biology as a subject in their secondary education. In contrast, students of NHRF mostly learn health sciences during the middle school since the subject Health and Physical education is compulsory only for grades 6 to 9 and it is a basket subject for grade 10-11 in the school curriculum in Sri Lanka. This might have influenced the better knowledge and practice scores among students of HRF than the NHRF as the former group study biology for a longer period which included content related to human body and common diseases at preliminary level.

Although the numerous studies have reported various statistics relation to oral health care and practices among different populations a lack of common scale to measure those attributes is a limitation during comparison. However, knowledge on the dental caries, periodontal diseases and risk behaviors are the common elements of most of the studies. First-year undergraduates of the present sample seemed to have a satisfactory level of basic oral health knowledge and practices (Table 2) compared to some of the populations in India and Nigeria. As reported by Bashiru & Omotola (2016) the mean oral health knowledge score among 20-34-year-old medical, pharmacy, and nursing students in Nigeria was  $64.40 \pm 8.85$  and their oral hygiene behavior score was  $55.66 \pm 11.04$ .<sup>1</sup> Sharda et al. (2009) showed mean scores of  $53.25 \pm 15.05$  and  $59.09 \pm 18.77$  for oral health knowledge and behavior, respectively, among Indian professional students.<sup>6</sup>

The commonest self-care oral hygiene practice is tooth brushing. The national oral health survey conducted in 2015-2016 in Sri Lanka revealed that 55.8% of 15-year-old and 73.3% of 35-year-old brush their teeth twice a day.<sup>7</sup> A study which investigated brushing habits of university students across 26 countries including Asian countries reported that 67.2% of students brush their teeth twice or more times a day.<sup>7</sup> The above study did not include Sri Lanka and it had been done in 2013. The present observation of comparatively higher prevalence (77.57%) tooth brushing among first year undergraduates at least twice a day maybe due to increased health awareness with and health literacy levels.

Even though the undergraduates of the present study seemed to have a relatively satisfactory level of basic oral health knowledge and practices, some knowledge deficits and inadequate practices were revealed from our results. For example, knowledge on relationship between oral health and systemic health, use of interdental cleaning aids (IDCA) and consumption of fizzy drinks and therefore emphasis on these aspects is imperative in health education strategies. The link between oral health and systemic health is commonly discussed in the literature. But, the awareness among the general public is doubtful and only a few studies studied on this aspect.<sup>2</sup> Al-zarea in 2013, showed that 52% of first year university students in Saudi were aware regarding the effect of diabetes mellitus on gum health.<sup>2</sup> In our study, among all students, 66.12% knew that poor gum health has close connection with systemic diseases such as diabetes. This could be attributed to inadequate dissemination of relevant information regarding the association of systemic and oral health through health education programs and less emphasis given by health practitioners for their patients due to lack of updated knowledge.

Although routine use of IDCA is a recommended oral hygiene practice which improves the efficiency of home-based plaque control measures several studies in different

countries confirmed poor use of IDCA by young adults. Only one fifth (21.42%) of the students of the current study were using any kind of IDCA. Similarly, less percentages had been reported among university students in Nigeria (6%) and Italy (14%).<sup>8,9</sup> IDCA were not popular among university students of Sri Lanka probably due to inadequate instructions on IDCA use delivered by dental professionals, lack of awareness regarding IDCA for plaque control, unavailability and high cost of IDCA in the market and poor attitude. Therefore, dental professionals must be encouraged to have continuous professional education regarding updates in oral hygiene practices and to educate their patients regarding use of IDCA. Information regarding IDCA could also be delivered through oral health promotion campaigns and advertisements. Improving availability of IDCA for an affordable price in the market is equally important.

Our study focused on the dietary habits relevant to oral health behavior. Frequent consumption of soft drinks is a growing issue related to dental and systemic health among young generation worldwide. A study by Ratnayake and Ekanayake (2012) reported that 82% adolescents (17-year-old) in Colombo District consumed soft drinks once a week or more.<sup>10</sup> Recent study reported a lesser consumption frequency within a week (4.5%) among the 20-25-year-old in Ampara district, a remote area in Sri Lanka.<sup>11</sup> In contrast more than half (51.98%) of the students in the present study reported to have soft drinks daily which is a significantly higher proportion. This significant difference may be attributed to university environment which is more conducive for consumption of fizzy drinks due to socialization among friends and easy access to variety of such drinks.

Socioeconomic status, parental education, age and gender are reported be some of the associated factors leading to disparity in health status including oral health knowledge and hygiene behaviors.<sup>11</sup> In consistent with previous reports the present study revealed that the oral health knowledge changes significantly with parental education, gender, and age. Well-educated parents are more likely to have better health literacy and good oral health practices as they have better socioeconomic status and hence access to good health facilities.<sup>12</sup> However, in the present study, practices like plaque control measures changes only with the gender. Moreover, ethnicity and hometown did not influence either on knowledge or practices. Students of this study are with good education level irrespective of their hometown and hence influence of other factors could be minimum. Better oral health knowledge and more positive oral health behavior among female could be due to the influence of various factors. Female have shown higher dental anxiety and they are apparently more concern about well-being, appearance, beauty, and having more positive attitudes towards health.

Since our participants achieved a higher score following a competitive national level selection examination in the

country they can be considered as a studious group. Specially students of HRF have more inclination towards health-related matters and their attitudes toward self-oral care may be different from others of the same cohort. Hence, the present sample may not be a representation of young adults in the country. However, the information generated in our study is helpful to assume the level of oral health knowledge and practices on the similar age group of the country. As there is a close association between level of education and health knowledge<sup>11</sup> it could be inferred that the level of oral health knowledge and practices should be lower than in the reported values of the present study and hence strategies must be identified to improve oral health in the population.

Although this study has some limitations such as restricted sample size covering all ethnic groups and lack of clinical evidence which need oral examination, results of this study will be of some help to fill the information gap about oral health knowledge and practices of young adults in Sri Lanka. In conclusion, our finding emphasis the importance of incorporation health science subject including oral health in the syllabus as a compulsory subject. Further our findings highlight the need of integration of health awareness sessions aimed at changing attitude and behaviors toward good oral health into university orientation programs which are conducted for students before the start of specific academic program. Further, implementation of gender-specific programs for oral health promotion is suggested to minimize the gender-based inequality of oral health knowledge and practices.

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## 6. Conflict of Interest


None.

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