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ORIGINAL ARTICLE

Knowledge, Attitude, and Practices of Interdental Aids among Dental and Medical Malaysian Students in Davangere District, Karnataka, India

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ABSTRACT

Objectives: The purpose of this study was to evaluate knowledge, attitude, and practice (KAP) regarding interdental aids in students of Malaysian origin pursuing their education in India.

Materials and methods: The subjects comprising the population of this study were dental and medical Malaysian students residing at Davangere. This questionnaire included 46 items designed to evaluate KAP among dental and medical students regarding the interdental aids' use and their oral health practices. Data analysis was performed using chi-square test, mean age ± standard deviation, and percentage.

Results: This study included 232 subjects. Percentages and analysis of correct responses according to Bachelor of Dental Surgery (BDS) and Bachelor of Medicine, Bachelor of Surgery (MBBS) students were determined. The knowledge-based "Yes" responses were highest in dental students, followed by medical students.

Conclusion: The KAP of interdental aids of BDS students were better than those of MBBS students. The dental students provided significantly higher correct responses pertaining to interdental aids.

Keywords: Attitude, Interdental aids, Knowledge, Practice, Student population.

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INTRODUCTION

The bacterial plaque that forms on all hard and soft oral tissues is considered to be the principal etiological agent in periodontal diseases. The accumulation of plaque facilitated by poor oral health maintenance predisposes to gingivitis, leading to the onset of periodontal inflammation. There is evidence that improvement in oral hygiene will lead to reduction in gingival inflammation. It has also been convincingly demonstrated that periodontal disease is most frequent and severe in the interproximal areas, and it is recognized to progress faster interdentally. Subsequently, achieving adequate plaque control in these areas is of great importance. The most common method, i.e., followed for regular maintenance is toothbrush, which alone is not sufficient for keeping the teeth and surrounding structures healthy. Besides the use of toothbrush certain interdental aids (dental floss, interdental brushes, and wooden rubber tips) are also to be used. The knowledge, attitude, and practice (KAP) pertaining to the interdental aids are known to a little extent than it is required.

A person's attitudes are defined by cognitive, affective, and behavioral components. The cognitive component represents the person's beliefs and knowledge, the affective component the strength of their beliefs, and the behavioral component their readiness to act to a certain object or situation. Thus, attitudes to dental care could be defined, e.g., by self-assessment of one's dental health (cognitive), and the inclination to attend for regular dental examination (behavioral).[1] Appropriate data from representative population studies are needed that can be used for planning of preventive and curative oral health care programs and developing training programs for dental personnel. However, the studies related to KAP on interdental aids in India and from the global front are scarce. Medline database reveals those surveys wherein KAP regarding oral health in terms of oral hygiene practices is mainly focused on toothbrush and brushing. Flossing as a practice is not dealt much and especially the other interdental aids.[2] Concern has been expressed that improvements in oral health have been taking place in many Western countries, whereas deterioration of oral health has been taking place in many developing countries.[3]

Dental caries and periodontal disease are common and costly chronic diseases affecting modern societies. To a greater extent, their prevention and control depend on a person's lifestyle and behavior. However, for a long time, oral health care including oral health education has not attracted much attention in India. This situation began to

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change recently with an increase in dental schools, regular camps, and changes to the health care model. However, information about the oral health KAPs of dental students and faculty is still very limited, especially with regard to interdental cleaning aids.

Considering the oral self-preventive attitudes, little information exists about daily hygiene behavior or preventive professional advising compliance of Malaysian students studying in India. This lack of information makes it difficult to determine if any programs on oral health prevention using interdental aids are needed and eventually which ones have to be implemented. Little is known about the KAP of medical and dental students regarding interdental aids.

OBJECTIVE

The purpose of this study was to evaluate KAP regarding interdental aids in dental [Bachelor of Dental Surgery (BDS)] and medical [Bachelor of Medicine, Bachelor of Surgery (MBBS)] students of Malaysian origin pursuing their education in India.

MATERIALS AND METHODS

The study population consisted of dental and medical Malaysian students residing in Davangere, Karnataka, India. The study was presented in the form of questionnaire, which included 46 items designed to evaluate KAP among dental professionals and students regarding the interdental aids' use and their oral health practices (Table 1).

Assessment of participants' knowledge, regarding interdental aids included various methods to keep the interdental area cleaned, the various types of interdental cleaning aids for diseased tissue, the most commonly used aids, the purpose and importance of the interdental aids, assessment of participants' oral health attitude included the feelings regarding treatment, opinions about and attitude toward dental care and regular dental visits.

Subjects were asked to respond to each item according to the response format provided during the study. Response format included choices in which subjects chose one response from a provided list of options. Furthermore, the investigator was always available during completion of the questionnaire, and the participants were encouraged to approach whenever they needed the clarification of any point. This study included BDS (n = 125) and MBBS students (n = 107). The response is the reply to the questionnaire provided to each subject.

Participation was voluntary, and all participants remained anonymous. Demographic information was obtained including age, gender, and year of study. The data were collected during a period of 6 months. The questionnaire had specific questions regarding the use of interdental aids and required almost 20 minutes to fill the questionnaire.

Statistical analysis—descriptive, univariant; chi-square test was applied. Significant level was set at ≤0.05.

RESULTS

Percentage and analysis of knowledge-based "correct" responses for BDS *vs* MBBS are shown in Table 2. For knowledge-based items, the highly significant positive (<0.001) responses were higher in BDS students as compared with MBBS students for two items (12, 15). Significant positive response (<0.05) was found higher in BDS as compared with MBBS students for one item (1).

Percentage and analysis of attitude-based "correct" responses for BDS *vs* MBBS are shown in Table 2. For attitude-based items, the highly significant positive response (<0.001) was higher in BDS as compared with MBBS students for one item (12). Significant positive responses (<0.05) were found higher in BDS as compared with MBBS students for two items (5, 10).

Percentage and analysis of practice-based "correct" responses for BDS *vs* MBBS is shown in Table 2. For practice-based items, the highly significant positive responses (<0.001) were higher in BDS as compared with MBBS students for six items (1, 2, 3, 4, 8, and 15). Significant positive responses (<0.05) were found higher in dental professionals as compared with MBBS students for two items (11, 13).

Percentage and analysis of KAP based on "correct" responses according to gender differences in BDS students are shown in Table 3. For knowledge-based items, significant positive response (<0.05) was found higher in females compared with males in BDS for one item (12). The responses were nonsignificant (>0.05) for 15 items (1–11, 13, 14–16).

For attitude-based items, significant positive response (<0.05) was higher in females as compared with males in BDS for one item (3). The responses were nonsignificant (>0.05) for 11 items (1, 2, 4–12).

For practice-based items, the responses were nonsignificant (>0.05) for 15 items (1–6,8–16). Significant positive response (<0.05) was higher in females as compared with males in BDS for one item (18).

Percentage and analysis of KAP-based "correct" responses according to gender differences in MBBS students are shown in Table 4. For knowledge-based items, highly significant positive response (<0.05) was found higher in females compared with males in MBBS for one item (6). The responses were significant (>0.05) in females compared with males for three items (7, 9, 15). The responses were nonsignificant for 12 items (1–5, 8, 10–14, 16).

Table 1: Questionnaire

Sl. no.	*Knowledge domain*
1	Recommended interdental cleaning method for intact interdental papillae/narrow interdental space is
2	Recommended interdental cleaning method for a moderate papillary recession is
3	The diameter of a tuft in a single tufted brush is
4	Recommended interdental cleaning method for a complete loss of papilla is
5	Methods of dental flossing
6	One of the following materials is used to make a wood stick:
7	How many types of embrasures are present?
8	Most common/widely recommended interdental cleaning method
9	Interdental cleaning aids are used to
10	Historically, floss was made of one of the following materials:
11	Super floss is
12	Perio-aid is
13	Floss is available as
14	Col is
15	The depression in the gingival tissue under the contact area between the lingual and facial papillae.
16	What is the length of dental floss needed for flossing?
	Attitude domain
1	Do you think interdental cleaning is important for good gingival and periodontal health?
2	Do you think there is patient compliance in the use of interdental cleaning aid?
3	Do you think floss-induced injuries outnumber its benefits?
4	Do you think motivating the patients regarding the use of interproximal cleaning aids has any positive impact in the dental practice?
5	Do you think interdental plaque control is an essential component to complete the patient's self-care program?
6	Do you think multifilament floss is more beneficial than monofilament floss?
7	Do you think interdental area is vulnerable to gingival infection?
8	Do you think toothbrushing alone can accomplish plaque removal from the proximal tooth surfaces?
9	Do you think gingival col area is vulnerable to gingival disease?
10	Do you think it is important to know about the type of embrasure before prescribing the interdental cleaning aid?
11	Do you think selection of an appropriate interdental cleaning aid helps to reach optimum oral cleanliness?
12	Will you stop flossing if your gums bleed after/during flossing?
	Practice domain
1	How do you clean your teeth?
2	Do you use interdental cleaning aids?
3	Do you advise interdental cleaning to your patient?
4	How often do you use interdental cleaning aids?
5	How often do you recommend your patient to use interdental cleaning aids?
6	Would you advise disabled patients to use a dental floss holder?
7	Do you come across floss cuts and floss clefts in your practice?
8	Do you take history of personal oral care before prescribing interdental cleaning aids?
9	Do you use disclosing agent and record the plaque score before prescribing an interdental cleaning aid?
10	Do you help your patients to choose the appropriate interdental cleaning aid?
11	Do you educate your patients about the maintenance of interdental embrasures?
12	Do you advice the use of knitting yarn for isolated teeth, for teeth separated by diastema (spacing of teeth) and distal surfaces of most posterior teeth?
13	Do you advice tufted dental floss in partial denture, distal and mesial abutment, and orthodontic appliances?
14	Do you motivate the patient to accept the responsibility for the interdental care?
15	Do you take dental and gingival anatomy into consideration while prescribing an interdental cleaning aid?
16	In which conditions you will change to use a fresh part of floss?
17	What type of toothbrush do you use?
18	How often do you brush your teeth?

For attitude-based items, highly significant positive responses (<0.05) were higher in females as compared with males in MBBS for two items (1, 5). The responses were significant (>0.05) for two items (7, 11). The responses were nonsignificant for eight items (2–4, 6, 8–10, 12).

For practice-based items, the responses were nonsignificant (>0.05) for 15 items (1–6, 8–16). Significant positive response (<0.05) was higher in females as compared with males in MBBS for one item (18).

Total correct responses were categorized into <50% and >50%, which would provide better insight to find methods/strategies to enhance knowledge/attitude and practices related to interdental aids (Table 5).

There was no percentage response at 50. So they were categorized at <50 and >50. KAP total response was grouped percentage wise.

The maximum correct response was found for item 1 (80.8%). (Recommended interdental cleaning method for

Table 2: Percentage and analysis of KAP based on "correct" responses for BDS *vs* MBBS students

		BDS	*MBBS*	*Total*	*BDS vs MBBS*	
Items	*Response*	*n (%)*	*n (%)*	*n (%)*	χ^2 *test*	*p-value*
K1	1	109 (88.6)	76 (71.7)	185 (80.8)	10.5	0.001 HS
K2	2	90 (73.2)	84 (79.2)	174 (76)	1.15	0.28 NS
K3	2	39 (32.2)	28 (26.7)	67 (29.6)	0.83	0.36 NS
K4	1	88 (71.5)	63 (59.4)	151 (65.9)	3.71	0.05 S
K5	1	80 (65)	56 (54.4)	136 (60.2)	2.66	0.10 NS
K6	2	53 (43.8)	37 (35.2)	90 (39.8)	1.72	0.19 NS
K7	1	63 (52.5)	50 (49.5)	113 (51.1)	0.19	0.65 NS
K8	2	95 (77.2)	76 (73.1)	171 (75.3)	0.52	0.45 NS
K9	1	36 (29.5)	31 (29.2)	67 (29.4)	0.002	0.96 NS
K10	1	82 (67.8)	62 (59)	144 (63.7)	1.84	0.17 NS
K11	1	27 (22.1)	30 (28.3)	57 (25)	1.15	0.28 NS
K12	1	101 (85.6)	71 (67.6)	172 (77.1)	10.1	0.001 HS
K13	2	91 (76.5)	75 (71.4)	166 (74.1)	0.73	0.39 NS
K14	2	98 (81)	80 (76.9)	178 (79.1)	0.56	0.45 NS
K15	1	87 (73.7)	52 (50)	139 (62.6)	13.2	0.001 HS
K16	2	30 (25.2)	16 (15.2)	46 (20.5)	3.39	0.06 NS
A1	1	105 (85.4)	86 (81.1)	191 (83.4)	1.3	0.52 NS
A2	1	60 (49.2)	58 (54.7)	118 (51.8)	0.88	0.64 NS
A3	2	76 (61.8)	52 (49.1)	128 (55.9)	3.82	0.14 NS
A4	1	100 (82)	85 (80.2)	185 (81.1)	1.29	0.52 NS
A5	1	99 (80.5)	75 (70.8)	174 (76)	8.16	0.01 S
A6	1	53 (43.4)	58 (54.7)	111 (48.7)	3.07	0.21 NS
A7	1	87 (71.3)	68 (64.8)	155 (68.3)	1.24	0.53 NS
A8	2	98 (79.7)	73 (69.5)	171 (75)	5.4	0.06 NS
A9	1	88 (71.5)	65 (61.9)	153 (67.1)	2.39	0.30 NS
A10	1	93 (76.2)	63 (60.6)	156 (69)	7.22	0.02 S
A11	1	103 (83.7)	93 (88.6)	196 (86)	1.59	0.45 NS
A12	2	47 (38.8)	25 (23.8)	72 (31.9)	11.2	0.004 HS
P1	2	93 (75.6)	50 (47.6)	143 (62.7)	18.9	0.001 HS
P2	1	94 (76.4)	47 (44.8)	141 (61.8)	24.06	0.001 HS
P3	1	102 (82.9)	69 (65.7)	171 (75)	8.95	0.003 HS
P4	1	95 (79.8)	55 (52.9)	150 (67.3)	18.3	0.001 HS
P5	1	95 (77.9)	73 (69.5)	168 (74)	2.04	0.15 NS
P6	1	74 (61.2)	54 (52.4)	128 (57.1)	1.73	0.18 NS
P8	1	92 (75.4)	55 (53.4)	147 (65.3)	12.55	0.002 HS
P9	1	78 (63.9)	53 (51.5)	131 (58.2)	3.57	0.06 NS
P10	1	89 (73.6)	64 (62.1)	153 (68.3)	3.35	0.06 NS
P11	1	82 (67.2)	55 (52.4)	137 (60.4)	5.18	0.02 S
P12	1	43 (35.8)	44 (42.3)	87 (38.8)	0.98	0.32
P13	1	75 (62.5)	47 (45.6)	122 (54.7)	6.36	0.01 S
P14	1	94 (79)	73 (69.5)	167 (74.6)	2.63	0.10 NS
P15	1	96 (79.3)	67 (63.8)	163 (72.1)	6.74	0.009 HS
P16	2	64 (52)	45 (42.5)	109 (47.6)	2.09	0.14 NS
P18	2	97 (79.5)	90 (85.7)	187 (82.4)	1.49	0.22 NS

HS: Highly significant; NS: Not significant; S: Significant

intact papillae/narrow interdental space is dental floss.) Out of five knowledge-based items (<50% of correct responses), the item 16 had least response of 20.5% (length of dental floss is 12 to 18 inches).

The maximum percentage of correct response was found for item 11 (86%) (Do you think interdental cleaning is important for good health?). Out of two attitude-based items (<50% correct response), item 12 (Will you stop flossing if your gums bleed after/during flossing?) had least response (31.9%).

The maximum percentage of correct response was found in item 18 (82.4%) (Do you take the history of personal oral care before prescribing on interdental cleaning aid?). Out of 18 practice items (<50%, correct response), item 12 (Do you advice interdental cleaning to your patient?) had the least response (38.8%).

Table 3: Percentage and analysis of KAP-based "correct" responses according to gender differences in BDS students

		Male	*Female*	*Total*	*Male vs female*	
Items	*Response*	*n (%)*	*n (%)*	*n (%)*	*$\chi 2$*	*p-value*
K1	1	30 (88.2)	79 (88.8)	109 (88.6)	0.007	0.93 NS
K2	2	21 (61.8)	69 (77.5)	90 (73.2)	3.11	0.07 NS
K3	2	12 (35.3)	27 (31)	39 (32.2)	0.2	0.65 NS
K4	1	26 (76.5)	62 (69.7)	88 &1.5)	0.56	0.45 NS
K5	1	23 (67.6)	57 (64)	80 (65)	0.14	0.70 NS
K6	2	17 (50)	36 (41.4)	53 (43.8)	0.73	0.39 NS
K7	1	18 (52.9)	45 (52.3)	63 (52.5)	0.004	0.95 NS
K8	2	26 (76.5)	69 (77.5)	95 (77.2)	0.016	0.90 NS
K9	1	14 (41.2)	22 (25)	36 (29.5)	3.08	0.07 NS
K10	1	22 (64.7)	60 (69)	82 (67.8)	0.2	0.65 NS
K11	1	10 (29.4)	17 (19.3)	27 (22)	1.45	0.22 NS
K12	1	25 (73.5)	76 (90.5)	101 (85.6)	5.63	0.018 S
K13	2	24 (72.7)	67 (77.9)	91 (76.5)	0.35	0.55 NS
K14	2	28 (82.4)	70 (80.5)	98 (81)	0.057	0.81 NS
K15	1	26 (76.5)	61 (72.6)	87 (73.7)	0.18	0.66 NS
K16	2	9 (26.5)	21 (24.7)	30 (25.2)	0.04	0.84 NS
A1	1	28 (82.4)	77 (86.5)	105 (85.4)	1.59	0.45 NS
A2	1	20 (58.8)	40 (45.5)	60 (49.2)	2.07	0.35 NS
A3	2	15 (44.1)	61 (68.5)	76 (61.8)	7.44	0.02 S
A4	1	26 (76.5)	74 (84.1)	100 (82)	1.33	0.51 NS
A5	1	24 (70.6)	75 (84.3)	99 (80.5)	3.03	0.21 NS
A6	1	19 (55.9)	34 (38.6)	53 (43.4)	3.24	0.19 NS
A7	1	23 (67.6)	64 (72.7)	87 (71.3)	1.21	0.54 NS
A8	2	23 (67.6)	75 (84.3)	98 (79.7)	4.99	0.08 NS
A9	1	25 (73.5)	63 (70.8)	88 (71.5)	0.16	0.92 NS
A10	1	22 (64.7)	71 (80.7)	93 (76.2)	3.46	0.17 NS
A11	1	28 (82.4)	75 (84.3)	103 (83.7)	0.15	0.92 NS
A12	2	9 (26.5)	38 (43.7)	47 (38.8)	3.92	0.14 NS
P1	2	26 (76.5)	67 (75.3)	93 (75.6)	0.019	0.89 NS
P2	1	26 (76.5)	68 (76.4)	94 (76.4)	0.001	0.99 NS
P3	1	30 (88.2)	72 (80.9)	102 (82.9)	0.93	0.33 NS
P4	1	27 (79.4)	68 (80)	95 (79.8)	0.005	0.94 NS
P5	1	26 (76.5)	69 (78.4)	95 (77.9)	0.05	0.81 NS
P6	1	18 (52.9)	56 (64.4)	74 (61.2)	1.34	0.24 NS
P8	1	22 (64.7)	70 (79.5)	92 (75.4)	2.91	0.08 NS
P9	1	24 (70.6)	54 (61.4)	78 (63.9)	0.9	0.34 NS
P10	1	26 (76.5)	63 (72.4)	89 (73.6)	0.2	0.64 NS
P11	1	23 (67.6)	59 (67)	82 (67.2)	0.004	0.94 NS
P12	1	16 (47.1)	27 (31.4)	43 (35.8)	2.6	0.10 NS
P13	1	21 (61.8)	54 (62.8)	75 (62.5)	0.01	0.91 NS
P14	1	26 (76.5)	68 (80)	94 (79)	0.18	0.66 NS
P15	1	29 (85.3)	67 (77)	96 (79.3)	1.02	0.31 NS
P16	2	16 (47.1)	48 (53.9)	64 (52)	0.46	0.49 NS
P18	2	22 (64.7)	75 (85.2)	97 (79.5)	6.33	0.01 S

NS: Not significant; S: Significant

DISCUSSION

Epidemiological surveys have indicated that bacterial plaque is the dominant etiological factor in periodontitis.[4] Furthermore, it has been convincingly demonstrated that gingivitis is most frequent and most severe in the interproximal areas. Generally, these areas are inaccessible to the toothbrush.[5] Available data have shown that gingivitis can be prevented buccally and lingually by the correct use of a toothbrush,[6] but the toothbrush alone has limited effect in the interdental spaces. With this shortcoming in view, several other materials have been devised to supplement the toothbrush.[7] Dental floss, toothpicks, and single tufted brushes are some of the tools recommended for interdental cleaning.[8]

Table 4: Percentage and analysis of KAP-based "correct" responses according to gender differences in MBBS students

		Male	*Female*	*Total*	*Male vs female*	
Items	*Response*	*n (%)*	*n (%)*	*n (%)*	χ^2	*p-value*
K1	1	19 (61.3)	57 (76)	76 (71.7)	2.33	0.126 NS
K2	2	21 (67.7)	63 (84)	84 (79.2)	3.52	0.060 NS
K3	2	10 (33.3)	18 (24)	28 (26.7)	0.95	0.32 NS
K4	1	17 (54.8)	46 (61.3)	63 (59.4)	0.38	0.53 NS
K5	1	14 (45.2)	42 (58.3)	56 (54.4)	1.51	0.21 NS
K6	2	17 (54.8)	20 (27)	37 (35.2)	7.4	0.007 HS
K7	1	9 (31)	41 (57)	50 (49.5)	5.55	0.01 S
K8	2	21 (70)	55 (74.3)	76 (73.1)	0.2	0.65 NS
K9	1	14 (45.2)	17 (22.7)	31 (29.2)	5.36	0.02 S
K10	1	15 (48.4)	47 (63.5)	62 (59	2.06	0.15 NS
K11	1	11 (35.5)	19 (25.3)	30 (28.3)	1.11	0.29 NS
K12	1	17 (54.8)	54 (73)	71 (67.6)	3.28	0.07 NS
K13	2	19 (61.3)	56 (75.7)	75 (71.4)	2.21	0.13 NS
K14	2	22 (73.3)	58 (78.4)	80 (76.9)	0.3	0.58 NS
K15	1	20 (66.7)	32 (43.2)	52 (50)	4.68	0.03 S
K16	2	6 (20)	10 (13.3)	16 (15.2)	0.73	0.39 NS
A1	1	23 (74.2)	63 (84)	86 (81.1)	10.07	0.006 HS
A2	1	21 (67.7)	37 (49.3)	58 (54.7)	3.07	0.21 NS
A3	2	12 (38.7)	40 (53.3)	52 (49.1)	5.43	0.06 NS
A4	1	24 (77.4)	61 (81.3)	85 (80.2)	1.94	0.37 NS
A5	1	16 (51.6)	59 (78.7)	75 (70.8)	8.94	0.01 HS
A6	1	19 (61.3)	39 (52)	58 (54.7)	1.49	0.47 NS
A7	1	19 (61.3)	49 (66.2)	68 (64.8)	5.95	0.05 S
A8	2	17 (56.7)	56 (74.7)	73 (69.5)	3.33	0.18 NS
A9	1	21 (70)	44 (58.7)	65 (61.9)	1.53	0.46 NS
A10	1	19 (63.3)	44 (59.5)	63 (60.6)	2.79	0.24 NS
A11	1	23 (76.7)	70 (93.3)	93 (88.6)	7.29	0.02 S
A12	2	9 (30)	16 (21.3)	25 (23.8)	0.96	0.61 NS
P1	2	12 (40)	38 (50.7)	50 (47.6)	0.97	0.32 NS
P2	1	9 (30)	38 (50.7)	47 (44.8)	3.7	0.054 NS
P3	1	23 (76.7)	46 (61.3)	69 (65.7)	2.23	0.13 NS
P4	1	16 (53.3)	39 (52.7)	55 (52.9)	0.003	0.95 NS
P5	1	23 (76.7)	50 (66.7)	73 (69.5)	1.01	0.31 NS
P6	1	14 (46.7)	40 (54.8)	54 (52.4)	0.56	0.45 NS
P8	1	16 (53.3)	39 (53.4)	55 (53.4)	0.42	0.81 NS
P9	1	17 (56.7)	36 (49.3)	53 (51.5)	0.46	0.48 NS
P10	1	19 (63.3)	45 (61.6)	64 (62.1)	0.026	0.87 NS
P11	1	15 (48.4)	40 (54.1)	55 (52.4)	0.28	0.59 NS
P12	1	16 (51.6)	28 (38.4)	44 (42.3)	1.56	0.21 NS
P13	1	17 (54.8)	30 (41.7)	47 (45.6)	1.51	0.21 NS
P14	1	24 (77.4)	49 (66.2)	73 (69.5)	1.29	0.25 NS
P15	1	23 (74.2)	44 (59.5)	67 (63.8)	2.05	0.15 NS
P16	2	11 (35.5)	34 (45.3)	45 (42.5)	0.87	0.35 NS
P18	2	22 (73.3)	68 (90.7)	90 (85.7)	5.25	0.02 S

HS: Highly significant; NS: Not significant; S: Significant

Personal oral hygiene and periodic professional care remain the actions of choice to prevent periodontal diseases.[9] A wide range of interdental aids are manufactured by STIM (www.drdentaids.com) that are economical and available in India. The personal use and prescription of interdental aids are recommended that improves oral hygiene of natural and artificial teeth.[10] The American Dental Association (ADA) recommends that brushing and flossing be performed thoroughly at least once a day, with brushing duration being optimally about 3 minutes.[11] Further, the ADA advises that dental visits should be made on a regular basis. Although the efficacy of these preventive practices has been demonstrated in controlled clinical settings,[12] there is some question about the consequences of these behaviors as they are performed by the general public in "natural" settings.[13] It

Table 5: Total response percentage wise

Item no.	*<50%*	*Item no.*	*>50%*
Knowledge-based questionnaire			
1	–	1	80.8
2	–	2	76
3	29.6	3	–
4	–	4	65.9
5	–	5	60.2
6	39.8	6	–
7	–	7	51.1
8	–	8	75.3
9	29.4	9	
10	–	10	63.7
11	25	11	–
12	–	12	77.1
13	–	13	74.1
14	–	14	79.1
15	–	15	62.6
16	20.5	16	–
Attitude-based questionnaire			
1	–	1	83.4
2	–	2	51.8
3	–	3	55.9
4	–	4	81.1
5	–	5	76
6	48.7	6	–
7	–	7	68.3
8	–	8	75
9	–	9	67.1
10	–	10	69
11	–	11	86
12	31.9	12	–
Practice-based questionnaire			
1	–	1	62.7
2	–	2	61.8
3	–	3	75
4	–	4	67.3
5	–	5	74
6	–	6	57.1
8	–	8	65.3
9	–	9	58.2
10	–	10	68.3
11	–	11	60.4
12	38.8	12	–
13	–	13	54.7
14	–	14	74.6
15		15	72.1
16	47.6	16	–
18	–	18	82.4

is only fairly in recent times that there has been an increase in the interest focused on the behavior associated with oral hygiene.[14] This cross-sectional study focuses on the KAPs of interdental aids from both dental students and (MBBS) students of Malaysian origin. The study population presented a comprehensive review of the knowledge, attitude, and behavior regarding interdental aids. To the best of our knowledge, this represents the first study of its kind that explored these issues among both medical and dental populations. In the current study, a dental health questionnaire focused on KAP concerning interdental aids was used. The results of this study are presented in Tables 2 to 4. The first objective of the study was to evaluate KAP regarding interdental aids from BDS and MBBS students of Malaysian origin. The results, i.e., the total correct responses (Table 5), are discussed as there is scant literature in Medline search.

Total correct responses were categorized into <50% and >50%, which would provide better insight to find methods/strategies to enhance KAP related to interdental aids (Table 5). The maximum correct response was found for item 1 (80.8%). (Recommended interdental cleaning method for intact papillae/narrow interdental space is dental floss.) Out of five knowledge-based items (<50% of correct responses), item 16 had least response of 20.5% (length of dental floss is 12 to 18 inches). The maximum percentage of correct responses was found for item 11 (86%) (Do you think interdental cleaning is important for good health?). Out of two attitude-based items (<50% correct response), item 12 (Will you stop flossing if your gums bleed after/during flossing?) had least response (31.9%). The maximum correct-based response was found in item 18 (82.4%) (Do you take the history of personal oral care before prescribing an interdental cleaning aid?). Out of 18 practice items (<50% of correct responses), item 12 (Do you advice interdental cleaning to your patients?) had the least response (38.8%).

Those items that fell under the category <50% have to be addressed through Continuing dental education to improve the information. This calls for students to undergo dental education regarding interdental aids. Though these aids are not as big as toothbrush, they have a big role in preventing initiation of gingivitis in the interdental areas. Though the knowledge pertaining to interdental aids was adequate, its implementation through proper selection of interdental aids to maintain optimum oral health was compromised. The awareness regarding the beneficial effects of interdental aids could be demonstrated through clinical trials that are lacking in the literature. For the objective of gender-based comparison, Tables 4 and 5 demonstrate the results, as for any practice/behavior of health-related matters, knowledge is crucial and important. Without preinformation and knowledge, practices of oral health-related issues are not suggested personally.

In the current study, females expressed higher positive knowledge for items 6, 7, 9, 12, 15 than males. The items 1, 3, 5, 7, and 11 in attitude category and item 18 in practice category had higher positive responses from females.

In the current study, the gender difference in the use of toothbrush and interdental aid was not significant in contrast to the findings of a few studies.[15] The factor most consistently associated with toothbrushing frequency seemed to be gender. The better toothbrushing behavior of girls seemed to be universal except in France. It seems that boys require more targeted education programs than girls in almost all countries. In general, girls are more concerned about their personal hygiene than boys. It might also be more difficult to change the behavior of boys than girls, because girls tend to have more health-directed behavior than boys.[16] Flossing is practiced by fewer individuals but frequency has slowly increased over the years, with women being educated over the years and women being more frequent flossers.[17] Flossing has been shown to reduce gingival inflammation,[18] but the added benefits of toothbrushing and flossing over toothbrushing alone are uncertain.[19]

The role of oral bacteria and systemic disease is another important area of oral hygiene maintenance. Knowledge of relevant systemic conditions needs to be more extensive to enable dentists to interact more meaningfully with their medical colleagues. This will place new educational goals on the profession. In fact, it is not yet known whether the relationship between periodontal infection and systemic disease is a casual or a causal relationship.[20]

Although the current therapies that are used to manage periodontitis may be adequate to simultaneously manage systemic sequelae, there have been no studies to measure the systemic impact of periodontal treatments.[21] As an initial measure, it is of utmost importance to prevent/control plaque using mechanical method as a routine homecare measure. The inclusion of the interdental aids to remove plaque routinely from interdental areas would help prevent initiation of gingivitis in interdental area. Hence, KAP regarding interdental aids is necessary from both personal oral hygiene care and patient education and motivation. The emerging concept of periodontal medicine directly involves both the dentist and medical professionals to pay attention to patients' oral hygiene maintenance, including interdental cleaning measures. Both medical professionals and dentists will need to assume a larger responsibility for the overall health of patients, and eventually periodontal care may become a medical necessity. The KAP-oriented survey among medical students and professionals reported the low positive response toward interdental aids, which calls for mass educative programs regarding different interdental aids.[22] In Indian scenario, the interdental aids manufactured by STIM Dental aids (Imported and Manufactured by Global Dental Aids Pvt. Ltd. New Delhi) and ICPA Health products, Mumbai are available for personal oral hygiene maitainence. The quality and support by the company is commendable and the professionals need to recommend the entire range of interdental aids regularly which are economical and easily available.

CONCLUSION

Baseline information on oral health associated with adequate preventive procedures is fundamental to promote self-preventive behavior. It appears that KAPs concerning interdental aids among dental population are in need of improvement. Both descriptive and analytical epidemiological oral surveys can add considerably to the knowledge concerning oral health of the population and provide a basis for oral health policy. The effect of this behavior remains unclear despite four decades of research. The results of this study indicate that the attitude of Malaysian dental and medical students toward interdental aids needs to be improved. Comprehensive oral health educational programs are required to achieve this goal. This study provides data for future research and allows comparisons with other nationals.

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