

Performance of Dental Students and Interns in the Motivation and Verbal Delivery of Oral Hygiene Instructions in Dental Practice

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ABSTRACT

Aim: The aim of this survey was to evaluate the ability of dental students and interns to deliver oral hygiene instructions.

Materials and methods: This survey targeted patients aged 17–67 years who sought different dental treatments performed by final (sixth)-year dental students or dental interns. Both patients and therapists participated in filling out the questionnaire. The questionnaire included an exploration of the ability of therapists to prescribe dental hygiene aids commonly used in oral hygiene dentistry.

Results: In total, 150 patients and 150 therapists of both genders participated in this survey. The results showed that 47.3% of all therapists taught the patients the brushing technique; however, only 20% of the therapists reinforced oral hygiene instructions. Similarly, only 26% of therapists instructed their patients to renew their toothbrushes regularly, and 34% of the therapists instructed the patients on using dental floss. Only 32% of therapists prescribed a mouthwash to their patients, and 40.7% of the therapists used a disclosing agent. The difference was highly significant between students and interns in all the above activities, in favor of the dental students.

Conclusion: The result shows a low level of therapist's performance, both students and interns, in delivering oral hygiene instructions to their patients.

Clinical significance: Dental students and interns take a big responsibility in motivation and delivery of oral hygiene instructions in dental clinics to their patients. Evaluate the performance of students and interns in delivering oral health instructions in dental clinics will facilitate establish oral health programs to ensure improve the performance of therapists in motivation and delivering the oral hygiene instructions and therefore increase the ability of patients to respond.

Keywords: Delivering, Dental hygiene, Motivation.

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INTRODUCTION

Good dental health improves the ability to smile, speak, and eat, which lead to a better life. There is strong evidence that patients' knowledge level can be improved by receiving oral health information from an oral health therapist.¹ Moreover, oral hygiene programs reduce the cost of dental treatment.² Oral hygiene procedures should be tailored to the lifestyles and abilities of people of all ages to enable these patients to make decisions to improve individual oral hygiene.^{3,4} Oral hygiene techniques vary; the ability to apply these techniques and deliver hygiene instructions in dental practice is different between individuals according to many factors, such as knowledge and cognitive performance of the therapist, motivation, manual dexterity, lifestyle, and compliance of the patients. Recent oral hygiene techniques used in adjunct with consistent professional care are capable of preventing most periodontal disease and caries. Dental brushing and flossing are regularly used, but dental flosses and interdental brushes can offer advantages in periodontal disease, though they require manual dexterity and cognitive ability.³ Chemotherapeutic adjunctive agents of mechanical measures using mouth rinses, dentifrices, chewing gums, and gels as delivery vehicles can improve oral hygiene. In a longitudinal evaluation of knowledge and behavior of patients after different dental health programs on young adults, the test groups exhibited better knowledge and significantly improved behavior compared with the control group; proximal dental cleaning increased from approximately 50% of the individuals

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at the baseline examination to approximately 90% at the end of the period.⁵ In a randomized controlled trial of a dental health education program for 10-year-old children, the children in the program had significantly lower mean plaque scores and greater knowledge about toothbrushes and disclosing tablets than the control children who did not go through the program.⁶ Similar studies confirmed improved dental hygiene knowledge among a test group compared with a control group after verbal delivery of oral health promotion.^{7–9} The same result was found in a 1-year follow-up in which parents were motivated to prevent oral diseases

in their young children.^{10–12} The main question in this survey search is, Do dental patients receive adequate dental health instructions from dental practitioners, regardless of whether they are dental students or general practitioners? The best people to answer this question are the patients themselves. Thus, this questionnaire mainly targeted patients undergoing dental treatments, since most of the surveys conducted in the field of dental hygiene have been aimed at students and their knowledge of the different techniques of hygiene and motivation and have not evaluated the seriousness and beliefs of students or dentists regarding the effectiveness of these techniques, as assessed through their adequate delivery of information about hygiene and motivation to the patients.^{13–16} So the present questionnaire aims to do the following:

- Evaluate the ability of dental students and interns to instruct and motivate patients.
- Compare students and interns in delivering oral hygiene instructions to patients.
- Compare males and females among both students and interns in delivering all instructions and motivations to the patients.
- Explore who is most responsible for the failure to properly encourage and motivate the patient. The research questions for this study were do the dental students in the final (sixth) year (comprehensive course) and interns (recent general practitioners) instruct and motivate their patients in the proper way, and do they deliver adequate oral hygiene instruction to their patients?

MATERIALS AND METHODS

The ability of sixth-year dental students and interns (general practitioners) to instruct and motivate patients was explored by using a questionnaire in the Arabic language that was administered at the Dentistry College of Jazan University between April and May 2018. The questionnaire consisted of two parts. The first part included 11 questions and was filled out by the patients undergoing treatments at dental clinics just by ticking yes or no. The second part included two questions and was filled out by the therapists by selecting the proper answer from each question. Data in the first part of the questionnaire were collected in the absence of a therapist. In dental student clinics, the data were collected 2 weeks after starting treatment. In intern clinics, data were collected after finishing the last treatment visit. The data were collected by seven examiners (the author and six students). Verbal consent and approval was obtained from the patient after explaining the research. Also consent was obtained from the research unit in the College of Dentistry at Jazan University.

The First Part of the Questionnaire Included the Following:

Exploration of the ability of students and interns to prescribe mouthwashes or common dental hygiene aids and to encourage the patients to use the following procedures: brushing techniques, dental flossing, interdental brushing, and use of disclosing agents.

Exploration of the ability of therapists to use any motivation technique, such as showing the patients an educational dental video, giving them a pamphlet, or showing them dental pictures, to illustrate the importance of dental hygiene in disease prevention. In addition, some detailed information was explored, such as if the therapists asked to check the patient's toothbrush and if they advised toothbrush renewed.

The Second Part of the Questionnaire

This part consisted of two questions and was filled out by the students and interns. The first question aimed to explore who was more responsible for patient compliance (the therapist or the patient), and the second question was what was the main reason the therapists failed to deliver the proper oral hygiene instructions and motivation to the patients. In response to this question, the therapists had to select one of the following three answers: the oral hygiene information was not learned in relevant courses during their studies or the oral hygiene information was learned but the therapist did not deliver the use of this knowledge to the patient because of the poor knowledge of therapists or the therapist could not find enough time to give the information to the patient.

Sample Selection

This survey included patients aged 17–67, the patients were undergoing different dental treatments delivered by sixth-year (comprehensive course) students or interns (recent general practitioners after sixth year) at dental clinics of the College of Dentistry at Jazan University. Any therapist or patient filled out the questionnaire only once. The dental comprehensive sixth-level student had to select patients with multiple dental problems and conduct a comprehensive, full treatment for this patient over at least 1 month. The interns had to treat a patient with any dental problems and conduct a single dental treatment according to the patient's chief complaint. Contact hours for interns were twice as long as for dental students.

Excluding Criteria

Patients with any of the following characteristics were excluded: inability to speak in an understandable language, psychiatric patients, age below 17 years old, fully edentulous, refusal to enroll in the study by the patient or therapist, or the patient was a dentist or dental student or worked as a dental technician or dental hygienist.

Sample Groups were Compared as Follows

Students and interns (general practitioners) were compared in delivering all instructions and motivations to the patients attending dental clinics (Table 1 and Figs 1 and 2). Female therapists and male therapists were compared in delivering all instructions and motivations (Tables 1 and 2).

The main responsible causative factors of oral health deterioration among the patients who visited dental clinics were compared between students and general practitioners (Figs 3 and 4).

Ethical Approval

The protocol of this study was approved by the Internal Review Board, College of Dentistry, Jazan University.

Statistical Analysis

Data were handled and analyzed using SPSS for Windows, version 25 (IBM Corp., Armonk, NY, released in 2017). All data were categorical and hence are presented as frequency and proportions. Associations by different grouping factors were analyzed using the Chi-square test. A *p* value of <0.05 was considered significant.

RESULTS

The sample included 150 patients (89 male and 61 female patients), with an average age of 32.8 ± 10.6 years.

Table 1: Percentage of therapists who provided different dental hygiene procedures to their patients according to course level (students and interns) and gender (male and female)

Activity	Brushing	Repeat instruction	Renew brush	Flossing	Disclosing agent	Mouthwash	p value	Dental brush	Dental floss	Interproximal brush	Motivation	Show brush	p value
All	47.3	20	26	34	40.7	32		18.7	14	6	9.3	4	
Students	59.7	33.3	38.9	45.8	63.9	43.1	HS	25	16.7	6.9	12.5	4.2	NS
Interns	35.9	7.7	14.1	23.1	19.2	21.8		12.8	11.5	5.1	6.4	3.8	
Male	43.8	18	20.2	31.5	40.4	27	NS	15.7	10.1	5.6	7.9	3.4	NS
Female	52.5	23	34.4	37.7	41	39.3		23	19.7	6.6	11.5	4.9	

HS, $p < 0.001$; NS, $p > 0.05$

And 150 therapists (72 dental students in their sixth year and 78 interns), consisting of 89 males and 61 females. All 72 dental students (100% response rate), all 78 interns (100% response rate), and 141 patients (94% response rate) participated in the surveys. Nine patients refused to enroll in this study, instead other patients were taken who had finished their dental treatments to reach 150 patients.

Encouragement of the Patients on Brushing Technique

In total, 47.3% of all therapists encouraged the patients to have proper brushing technique on an artificial dental model. A total of 59.7% of dental students instructed the patients on the brushing technique on an artificial dental model compared with 35.9% of interns (Fig. 2). In regard to gender, 52.5% of females encouraged the patients to have proper brushing technique on an artificial dental model compared with 43.8% of males (Table 1). The difference was not significant ($p = 0.322$).

Reinforcement of Oral Hygiene by Repeating the Oral Instructions

Only 20% of all therapists reinforced hygiene instructions by repeating the oral instructions (brushing techniques) to the patients in later treatment visits (Table 1). A total of 33.3% of dental students did so compared with only 7.7% of interns (Fig. 2). The difference was very highly significant ($p = 0.005$). A total of 23% of females repeated the oral instructions to their patients compared with 18% of males (Table 1). The difference was not significant ($p = 0.322$).

Instruction of the Patient to Renew the Toothbrush Regularly

Only 26% of therapists instructed the patient to renew their toothbrush regularly (Table 1). A total of 38.9% of dental students did so compared with only 14.1% of the interns (Fig. 2). The difference was very highly significant ($p = 0.001$). In addition, 34.4% of females instructed the patients to renew their toothbrushes regularly compared with 20.2% of males (Table 1). The difference was not significant ($p = 0.06$).

Instruction of the Patient in Using Dental Floss

A total of 34% of the therapists instructed the patients in using dental flossing (Table 1), including 45.8% of students and 23.1% of interns (Fig. 2). The difference was very highly significant ($p = 0.004$). The percentages for males and females were 31.5 and 37.7%, respectively (Table 1). The difference was not significant ($p = 0.48$).

Prescription of Mouthwash

A total of 32% of therapists prescribed mouthwash to the patients (Table 1). A total of 43.1% of dental students did so compared with 21.8% of the interns (Fig. 2). The difference was very highly significant ($p = 0.008$). A total of 39.3% of females prescribed mouthwashes, while 27% of males did (Table 1). The difference was not significant ($p = 0.154$).

Use of Disclosing Agent to Detect Plaque

A total of 40.7% of the therapists used a disclosing agent to detect plaque (Table 1), including 63.9% of students and 19.2% of interns (Fig. 2). The difference was very highly significant ($p = 0.00$). The percentages for males and females were 40.4 and 41%, respectively (Table 1). The difference was not significant ($p = 1.000$).



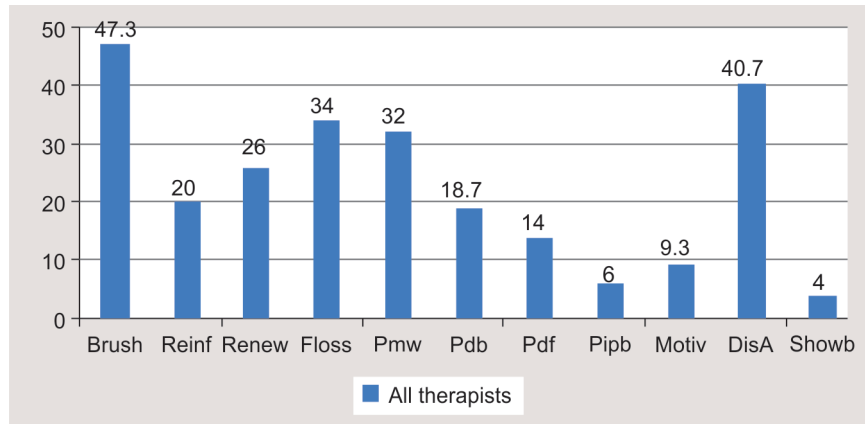


Fig. 1: Percentage of therapists who provided different dental hygiene procedures to their patients

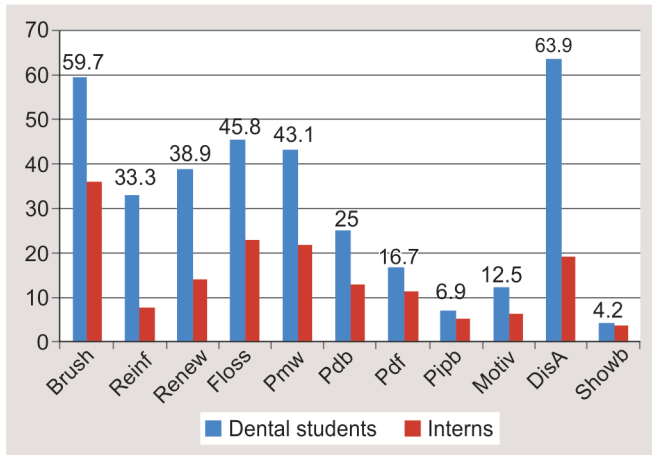


Fig. 2: Percentage of dental students and interns who provided different dental hygiene procedures to their patients

Prescription of a Toothbrush

Some 18.7% of therapists prescribed a toothbrush to the patient (Table 1). A total of 25% of dental students prescribed toothbrush to the patient, while 12.8% of the interns did (Fig. 2). The difference was not significant ($p = 0.06$). Among females, 23% prescribed a toothbrush to the patient compared with 15.7% of males (Table 1). The difference was not significant ($p = 0.291$).

Prescription of Dental Floss

A total of 14% of therapists prescribed dental floss to the patient (Table 1), including 16.7% of dental students and 11.5% of the interns (Fig. 2). The difference was not significant ($p = 0.5$). While 19.7% of females prescribed dental floss, only 10.1% of males did so (Table 1). The difference was not significant ($p = 0.149$).

Prescription of an Interdental Brush

In total, 6% of therapists prescribed an interdental brush to the patient (Table 1), including 6.9% of dental students and 5.1% of the interns (Fig. 2). The difference was not significant ($p = 0.738$). Among females, 6.6% prescribed an interdental brush compared with 5.6% of males. The difference was not significant ($p = 1.00$).

Motivation by Using Dental Pictures, Showing an Educational Dental Video, or Giving Pamphlets About Oral Hygiene

A total of 9.3% of therapists motivated patients by showing them dental pictures, a video, or a pamphlet about oral hygiene (Table 1), including 12.5% of dental students and 6.4% of interns (Fig. 2) ($p = 0.264$). A total of 11.5% of females motivated their patients in this way compared with 7.9% of males (Table 1). The difference was not significant ($p = 0.570$).

Request to the Patients to See Their Toothbrush

Only 4% of therapists asked the patients to show their toothbrushes (Table 1), including 4.2% of dental students and 3.8% of interns (Fig. 2). The difference was not significant ($p = 1.00$). In total, 4.9% of females and 3.4% of males made this request. The difference was not significant ($p = 0.687$).

Responsibility for Oral Health Deterioration among the Patients Who Visited Dental Clinics

A total of 88.9% of dental students believed that the responsibility for patient compliance lies with the patient (Fig. 3), and 11.1% of the dental students believed that this responsibility lies with the therapist. Similarly, 79.5% of interns, 82% of male therapists, and 86.9% of female therapists believed that the responsibility for patient compliance lies with the patient (Table 2). The difference was not significant between students and interns ($p = 0.126$) nor between males and females ($p = 0.501$).

Exploration of the Main Causative Factor of the Failure to Properly Encourage and Motivate the Patient

A total of 68% of dental students attributed their failure to encourage and motivate the patient to the fact that they learned to do this during their studies but did not apply it in practice, Similarly, 57.7% of interns, 57.4% of male therapists, and 62.7% of female therapists (Fig. 4). The difference was significant ($p = 0.016$) between students and interns and was highly significant ($p = 0.005$) between males and females. In total, 30.6% of dental students believed that there was no time to deliver the hygiene information to the patients. Finally, 1.4% of students, 14.1% of interns, 12.4% of males, and 1.6% of females answered that they did not learn the hygiene information and techniques during their courses of study (Table 2).

Table 2: Persons responsible for poor dental hygiene practices in the patients who visited dental clinics and main causative factors leading to therapists' failure to encourage and motivate the patients to have proper oral hygiene

Responsibility	Dentist (%)	Patients (%)	p value	Not taught (%)	Taught but not practice (%)	No time (%)	p value
All therapist	16	84		8	62.7	29.7	
Students	11.1	88.9	NS	1.4	68.1	30.6	NS
Interns	20.5	79.5		14.1	57.7	28.2	
Male	18	82	NS	12.4	57.4	41	NS
Female	13.1	86.9		1.6	62.7	29.3	
p value	HS		HS				

NS, $p > 0.05$; HS, $p < 0.001$

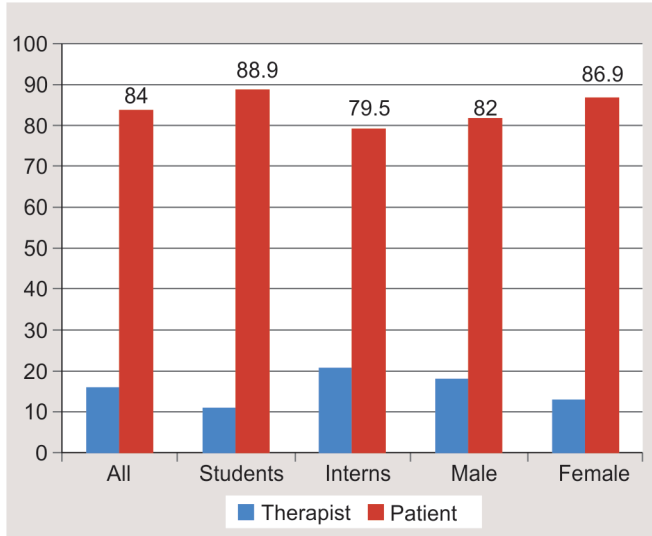


Fig. 3: Persons responsible for poor dental hygiene practices in the patients who visited dental clinics

DISCUSSION

Oral hygiene remains the most essential factor in maintaining and attaining periodontal health.¹⁷ This questionnaire included two parts, the first part included 11 questions or activities that the dental student or general practitioner (intern) usually conducted during their dental treatment sessions to encourage their patients on optimal oral health. The 11 questions were answered by patients who were undergoing treatment at intern clinics or student clinics. The interviewed patients filled out the first part of the questionnaire in the absence of the therapists. Moreover, the patients were notified that the information to be filled in, will be used in the research and will be confidential, even the therapist will be blinded from the patient's answers, which will allow the patient to fill in the answers without being affected by the therapist and to avoid embarrassment. Moreover, the dental students and interns who participated in this study were informed that their names would not be mentioned to facilitate the collection of the maximum amount of information from them. The questionnaire used only Arabic language because both the patients and therapists were spoken the Arabic language so that there was no language barrier in delivering the oral hygiene instructions; the questions were direct, clear, and simple; and the patient has only to tick yes or no. The interns usually treat patients for a short time, sometimes in one visit or more, so that the questionnaire was answered at the end of the treatment visit. However, the students in the comprehensive

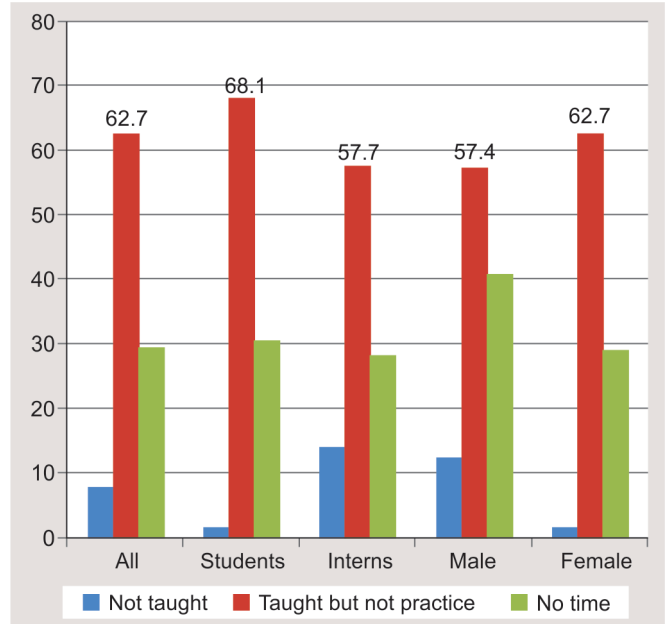


Fig. 4: Main causative factors leading to therapists' failure to encourage and motivate the patients to have proper oral hygiene

course usually continue treating patients for a long time until finishing the complete rehabilitation, so the questionnaire was conducted during the treatment visits (at least 1 week after the start of treatment). This may be one reason why students outweighed the interns in delivering instructions to the patients. Students had a longer time and a more full treatment plan aimed at rehabilitating the patient's full mouth, while the intern's treatment plan addressed the patient's complaint only, which may have made the intern neglect delivering oral health instructions and motivation as necessary. However, this finding is inconsistent with those from the study of Van Wyk¹³ which determined the knowledge of dental students regarding the requirements for the course in oral hygiene at the University of Stellenbosch and found that the knowledge of dental students in their second and third years regarding the requirements for the oral hygiene course was lower than that of senior students. The authors justified this finding by attributing it to students' improved knowledge after they come into contact with training in the next courses. A study by Krawczyk¹⁴ was conducted among 483 students, which aimed to estimate the knowledge connected with the rules of the oral hygiene and its correlation with everyday habits among the students of dental studies and medical studies at Medical School in Lublin; the study

concluded that students' knowledge of oral hygiene is not always correlated with practice. It was not the purpose of this research to evaluate the relationship between periodontal or dental disease and hygiene level; our questionnaire was focused on determining the performance of each group separately either they are students or interns, or they were males or females in delivering the real message about oral hygiene to their patients. It is known that female is more aware of dental hygiene than male, and therefore, this may be reflected in the performance of delivering oral hygiene instruction and motivate to the patients, so that it was reasonable to evaluate the performance of each group separately, particularly in our college where the male students attend clinical practice separately from female students. The sample size was not large because the questionnaire targeted only interns and sixth-year students, and the selection of students was strict and limited to these two courses only. Comparisons between the patients according to age, education level, or gender were not applicable because the questionnaire was limited to evaluating the ability of students and general practitioners to encourage the patients with oral hygiene instructions and motivations, not to evaluate the patients' tendency to apply these instructions and motivations. Less than 50% of both students and interns delivered oral hygiene instructions to their patients, in favor of dental students who showed more aware than interns about delivering oral hygiene instructions to the patients particularly with regard to learning patients' brushing techniques and using a disclosing agent to detect the plaque (Table 1); this may be attributed to their specific course that they have a very strict evaluation system that requires them to apply a full, comprehensive treatment, including delivering oral hygiene instructions and using disclosing agent in the diagnosis before starting the treatment. In contrast, interns do not follow a specific program of treatment for their patients, and there is no strict evaluation system for the treatment, so they usually neglect to deliver oral hygiene instructions. Patients were intentionally asked if the dental students prescribed mouthwash and dental hygiene aids rather than just telling the patients verbally to use them because the prescription of dental hygiene aids to the patient reflects the therapists' interest and their success in prompting patients to make the practice of oral health procedures a part of their daily health routine. Usually, therapists give instructions for the use of interdental brushes in specific conditions, such as for patients who have spaces between their teeth. These findings correspond to those of the survey of Knöfler¹⁸ which evaluated the oral health behavior of dental professionals and persons without professional dental knowledge (laypersons) regarding the use of aids for their personal oral hygiene; they found a low acceptance for the use of interdental tools for personal dental hygiene among 356 dental professionals and laypersons. Thus, this finding can partially justify the neglect of therapists in this survey in prescribing interproximal hygiene aids to their patients. However, the percentages of therapists were very low, with 14 and 6% for dental floss and interproximal brushes, respectively, so it is very important to consider interproximal dental hygiene aids as an essential part of the oral hygiene process during the delivery of information to patients, according to patient need. Most therapists, in answering the first question of the second part of the questionnaire, blamed patients for their lack of oral health. However, the first part of the questionnaire showed a low percentage of therapists delivered oral hygiene instructions and motivation to their patients. Moreover, most therapists, in answering the second question of the second

part reported that the oral hygiene information was learned, but they did not deliver and encourage the use of this knowledge to the patient; they contradicted their answer to the first question of the second part and confirmed their responsibility. The patients have the last responsibility to maintain their oral health and expected to be responsible for their own preventive practice, but the dentist is responsible for providing information and supportive care, so dental students and dentists seem to bear the largest responsibility of dental patient's failure to deal with the hygiene instructions and motivation. Therefore, it is recommended to establish advanced dental hygiene evaluation program for students at the college starting from fourth level, enforce them to motivate, encourage dental hygiene techniques to their patients, and prescribe the proper interdental aids and antibacterial agents, which ensure to increase their beliefs in the performance of these techniques in dental hygiene practice. It is recommended to establish a separate cabinet in the college to train dental hygiene specialists to deliver motivation and hygiene information to patients before doing any dental procedure. It is also necessary to establish an advanced oral hygiene training program for intern practitioners, including a rigorous evaluation system. In future studies, it is suggested to compare the performance of general practitioners who work in private clinics with dental students and interns in terms of oral health promotion.

CONCLUSION

More than half of the therapists did not motivate or encourage their patients to practice good oral hygiene techniques. The dental students were more successful in delivering oral hygiene instruction and motivation to the patients than the interns was; however, they were both at the same low level in prescribing dental hygiene aids, such as toothbrushes, dental floss, and interdental brushes. Dental students and dentists seem to bear the largest responsibility of dental patients' failure to address hygiene instructions and motivation.

CLINICAL RELEVANCE

Scientific Rationale

Dental students and interns take a big responsibility in motivation and delivery of oral hygiene instructions to their patients. Unfortunately, many of them neglect to deliver oral hygiene instructions. This is the first survey that evaluated the performance of dental students and interns in the motivation and verbal delivery of oral hygiene instructions.

Principal Findings

More than 50% of participants in this survey neglect delivering oral hygiene instructions to their patients.

Clinical Implications

It is necessary to establish an advanced oral hygiene training program for dental students and interns, including a rigorous evaluation system.

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ABBREVIATIONS

Brush	Encourage the patient to brush their teeth
Reinf	Reinforcement by repeating oral hygiene instructions to the patient
Renew	Whether the therapist asked the patient about regular renew of toothbrushes
Floss	Encourage the patient to floss their teeth
Pmw	Prescribe mouthwash to the patient
Pdb	Prescribe dental brush to the patient
Pdf	Prescribe dental floss to the patient
Pipb	Prescribe interproximal brush to the patient
Motiv	Motivation
DisA	Using a disclosing agent to detect the plaque inside the patient's mouth
Showb	Whether the therapist asked to show and see the patient's toothbrush

REFERENCES

- Kay E, Vascott D, Hocking A, et al. A review of approaches for dental practice teams for promoting oral health. *Community Dent Oral Epidemiol* 2016;44(4):313–330. DOI: 10.1111/cdoe.12220.
- Cobban SJ, Edgington EM, Clovis JB. Moving research knowledge into dental hygiene practice. *J Dent Hyg* 2008;82(2):1–10.
- Choo A, Delac DM, Messer LB. Oral hygiene measures and promotion: Review and considerations. *Aust Dent J* 2001;46(3):166–173. DOI: 10.1111/j.1834-7819.2001.tb00277.x.
- Jönsson B, Öhrn K, Lindberg P, et al. Evaluation of an individually tailored oral health educational programme on periodontal health. *J Clin Periodontol* 2010;37(10):912–919. DOI: 10.1111/j.1600-051X.2010.01590.x.
- Hugoson A, Lundgren D, Asklow B, et al. The effect of different dental health programmers on young adult individuals. A longitudinal evaluation of knowledge and behaviour including cost aspects. *Swed Dent J* 2003;27(3):115–130.
- Worthington HV, Hill KB, Mooney J, et al. A cluster randomized controlled trial of a dental health education program for 10-year-old children. *J Public Health Dent* 2001;61(1):22–27. DOI: 10.1111/j.1752-7325.2001.tb03351.x.
- Blinkhorn AS, Gratrix D, Holloway PJ, et al. A cluster randomized, controlled trial of the value of dental health educators in general dental practice. *Br Dent J* 2003;195(7):395–400. DOI: 10.1038/sj.bdj.4810566.
- Jonsson B, Lindberg P, Oscarson N, et al. Improved compliance and self-care in patients with periodontitis—a randomized control trial. *Int J Dent Hyg* 2006;4(2):77–83. DOI: 10.1111/j.1601-5037.2006.00175.x.
- Hausen H, Seppa L, Poutanen R, et al. Noninvasive control of dental caries in children with active initial lesions. A randomized clinical trial. *Caries Res* 2007;41(5):384–391. DOI: 10.1159/000104797.
- Weinstein P, Harrison R, Benton T. Motivating parents to prevent caries in their young children: One-year findings. *J Am Dent Assoc* 2004;135(6):731–738. DOI: 10.14219/jada.archive.2004.0299.
- Weinstein P, Harrison R, Benton T. Motivating mothers to prevent caries: Confirming the beneficial effect of counseling. *J Am Dent Assoc* 2006;137(6):789–793. DOI: 10.14219/jada.archive.2006.0291.
- Wang SJ, Briskie D, Hu JC, et al. Illustrated information for parent education: Parent and patient responses. *Pediatr Dent* 2010;32(4):295–303.
- Van Wyk CW, Faul K, Stander I. What do dental students at the university of Stellenbosch know of the education and functions of oral hygienists? *SADJ* 2000;55(3):142–150.
- Krawczyk D, Pels E, Prucia G, et al. Students knowledge of oral hygiene vs its use in practice. *Adv Med Sci*. 2006;51(Suppl 1):122–125.
- Doshi D, Baldava P, Anup N, et al. A comparative evaluation of self-reported oral hygiene practices among medical and engineering university students with access to health-promotive dental care. *J Contemp Dent Pract* 2007;1(8):68–75. DOI: 10.5005/jcdp-8-1-68.
- Rudnicka NM, Bachanek T, Strycharz-Dudziak M, et al. Oral hygiene habits among tobacco-smoking and non-smoking students of the medical university of Lublin—chosen aspects. *Przegl Lek* 2010;67:871–874.
- Lang NP, Bartold PM. Periodontal health. *J Periodontol* 2018;89: S9–S16. DOI: 10.1002/JPER.16-0517.
- Knöfler G, Friedl K, Fresmann S, et al. Oral health behaviour and oral hygiene of dental professionals and laypersons - A survey performed in lower saxony, Germany. *Oral Health Prev Dent* 2017;15(4):347–355. DOI: 10.3290/j.ohpd.a38741.