

A questionnaire survey of dentists and dental students in China about denture adhesives

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Purpose: The purpose of this study was to investigate the interest and knowledge of dentists and dental students in China about denture adhesives.

Materials and Methods: Thirty-three fourth-year undergraduate dental students and 26 dentists from China were surveyed using a questionnaire about their knowledge and understanding of denture adhesives, including their education and clinical experience.

Results: The overall response rate was 96.6%. The response rate of the dental students was 93.9%, and that of the dentists was 100%. Significant differences between the two groups were found for eight questions. For the question "Have you heard of denture adhesives (DA)?", 83.9% of dental students answered "No", whereas 57.7% of dentists answered "Yes, but only a little". For the questions of "Have you ever been taught about denture adhesives (DA)?" and "Have you ever seen denture adhesives (DA) in books or lecture meetings?", over 70% of dentists and dental students answered "No". A logistic regression model (forward stepwise method) showed that it was possible to distinguish dentists from dental students with a probability of 76.6% by using one out of the 11 items.

Conclusion: The results suggest that the dental profession in China has little knowledge about denture adhesives. Furthermore, for dentists to educate patients about denture adhesives would take considerable time in the clinic. There was a difference in the understanding and experience of denture adhesives between dentists and dental students in China. (*Int Chin J Dent* 2008; 8: 33-37.)

Key Words: China, dental student, dentist, denture adhesive, questionnaire survey.

Introduction

Denture adhesives have been extensively used by denture wearers both with well-fitting and ill-fitting dentures as a means to enhance denture retention, stability and function.¹⁻⁶ The first patent for a denture adhesive was issued in 1913 in the United States, with other patents following in the 1920s and 1930s.⁷ The American Dental Association first reported the use of denture adhesives in 1935.⁸

Dentists have tended to hold negative opinions about the use of denture adhesives in the clinic,⁹⁻¹² although these products have gradually begun to gain acceptance. Denture adhesives have a legitimate and indispensable place in prosthetic dental treatment. Several reports noted that the main reasons for the use of denture adhesive are to improve fit, comfort, chewing ability, and also to improve patient confidence in wearing dentures.^{5,13} Fifteen percent of denture wearers in the United States used denture adhesives in 1980.^{14,15} Wilson et al.¹⁶ reported that 30 % of denture wearers used, or had used, denture adhesives. Although denture adhesives would be a useful adjunct to current prosthetic dental treatment, Coates¹⁷ noted that a significant number of subjects in his study did not know that denture adhesives existed.

Many studies have investigated the mechanical properties, cytotoxicity, and methods of testing the effectiveness of denture adhesives.¹⁸⁻²¹ Denture wearers' knowledge of denture adhesives has been investigated,^{13,22,23} however, little is known about dentists' knowledge and experience of denture adhesives. Denture wearers would benefit greatly from a dental professional's guidance regarding the use of denture adhesives.

However, in reality patients are rarely given any guidance at all about denture adhesives. Furthermore, the knowledge, experience and attitudes towards denture adhesives of undergraduate dental students and dentists remain unclear. The purpose of this study was to investigate the interest level and knowledge of denture adhesives in dental students and dentists in China.

Materials and Methods

In this study, 59 subjects were asked to complete and return a structured questionnaire (Table 1). The subjects were selected at random from fourth-year undergraduate dental students and dentists in China (Hebei Medical University, Shijiazhuang; Wuhan University, Wuhan). They included 33 dental students (men, 18; women, 15) and 26 dentists (men, 12; women, 14). The mean ages of the dental students and dentists were 22.7 and 27.0 years, respectively. The distribution and collection of the questionnaire was instituted by the members of this survey in China in 2006. This questionnaire was administered after explaining the aim of the survey to the subjects and gaining their consent.

The questionnaire was written in Japanese and then translated into Chinese. After discussion with the staff in China, it was decided to retain the same estimation criterion. The questionnaire consists of 11 questions; five questions about knowledge and comprehension, four questions about education, and two questions about clinical practice. Each question had three response options; “No” or “None” (score 0), “Yes, but only a little” or “Yes, occasionally” (score 1), and “Yes, very much” or “Yes, often” (score 2).

Chi-square tests were used to examine the differences in the responses for each item on the questionnaire between the two groups. Then, two stepwise logistic regression analyses were carried out on the dependent variable (group). The Wald statistic was used to test the null hypothesis that the regression coefficients were zero. The Nagelkerke R^2 statistic was used to discriminate how well the model was able to distinguish between the interest and knowledge of dentists and dental students. All analyses were computed with SPSS for Windows operating system (SPSS 10, SPSS Japan Inc., Tokyo, Japan).

Results

The response rate was 96.6%. The response rate of the dental students was 93.9% (n=31), and that of the dentists was 100% (n=26). Table 1 shows the questionnaire items and the percentage distributions of the responses. Significant differences between the two groups were found for eight questions. For the question “Have you heard of denture adhesives (DA)?”, 83.9% of dental students answered “No”, whereas 57.7% of dentists answered “Yes, but only a little”. For the question “Do you know of any disadvantages of denture adhesives (DA)?”, 69.2% of dentists and 93.6% of dental students answered “No”. For the question “Do you know the purpose of denture adhesives (DA)?”, 50.0% of dentists answered “Yes, but only a little”, whereas 83.9% of dental students answered “No”. For the question “How many domestic brands of denture adhesive (DA) do you know?”, all respondents answered “None”. For the questions “Have you ever been taught about denture adhesives (DA)?” and “Have you ever seen denture adhesives (DA) in books or lecture meetings?”, over 70% of dentists and dental students answered “No”. For the question “Have you ever seen any TV commercials about denture adhesives (DA)?”, over 96% of subjects answered “No”.

Table 2 shows the estimated coefficients and related statistics from the logistic regression model that predicts group membership. The model contained one variable using a forward stepwise method ($p < 0.01$); Q1

(Understanding of DA) and two variables using a backward stepwise method ($p < 0.1$); Q1 (Understanding of DA) and Q11 (Effectiveness of DA).

Table 1. Questionnaire items and percentage distributions of answers.

Item descriptions		Category score			χ^2 test
		2	1	0	
Q 1. Have you heard of denture adhesives?	CHD	0	15	11	A **
	CHS	0	5	26	
Q 2. Do you know what the function of a denture adhesive is?	CHD	0	13	13	A **
	CHS	0	5	26	
Q 3. Do you know of any disadvantages of denture adhesives?	CHD	0	8	18	A *
	CHS	0	2	29	
Q 4. How many imported brands of denture adhesive do you know?	CHD	0	2	24	B **
	CHS	0	0	31	
Q 5. How many domestic brands of denture adhesive do you know?	CHD	0	0	26	B NS
	CHS	0	0	31	
Q 6. Have you ever been taught about denture adhesives?	CHD	0	7	19	C ***
	CHS	0	5	26	
Q 7. Have you ever seen denture adhesives in books or lecture meetings?	CHD	0	4	22	C ***
	CHS	0	3	28	
Q 8. Have you ever seen any TV commercials about denture adhesives?	CHD	0	1	25	C ***
	CHS	0	0	31	
Q 9. Do you know any alternatives to denture adhesives?	CHD	0	0	25	A NS
	CHS	0	0	31	
Q10. Have you ever seen denture adhesives in the clinic?	CHD	0	7	19	C **
	CHS	0	2	29	
Q11. Do you think the use of denture adhesive is more effective than a clinical intervention such as relining?	CHD	0	7	13	A NS
	CHS	0	16	11	

A 2:Yes, very much, 1:Yes, but only a little, 0:No

B 2:Three or more, 1:Less than three, 0:None

C 2:Yes, often, 1:Yes, occasionally, 0:No

*, $p < 0.05$ **; $p < 0.01$ ***; $p < 0.001$ NS: Not significant

Table 2. Results of binary logistic regression analysis using two Wald methods.

Item No.	B	S.E.	Wald chi-square	Freedom	P	Exp (B)
Forward stepwise (Wald)						
Q 1: Understanding of DA*	2.37	0.72	10.93	1	0.001	10.68
Backward stepwise (Wald)						
Q 1: Understanding of DA*	2.56	0.78	10.73	1	0.001	12.94
Q11: Effectiveness of DA*	-1.32	0.76	3.03	1	0.082	0.27

*Denture adhesive

For the forward stepwise method, variables were entered in step 1 : Q1 in that order.

For the backward stepwise method, variables were removed in steps 1 to 8: Q1, Q2, Q3, Q4, Q6, Q7, Q10, Q11 in that order.

Table 3. Observed and predicted group membership using two Wald methods.

Group	Predicted status		Percentage correct
	Dentist	Student	
Forward Stepwise (Wald)			
Dentist	13	7	65.0
Student	4	23	85.2
Total			76.6
Backward Stepwise (Wald)			
Dentist	13	7	65.0
Student	4	23	85.2
Total			76.6

The cut value is 0.50. Negalkerke $R^2 = 0.324$ (forward stepwise), 0.394 (backward stepwise).

*Six dentists and four students were deleted because they did not give complete answers in the questionnaire.

Table 3 shows that 13 dentists (65.0%) were correctly predicted using the former method. Similarly, 23 dental students (85.2%) were correctly predicted. The Nagelkerke R^2 statistic was 0.324; that is, 32.4% of the variation in the outcome variable was explained by the logistic regression model.

Discussion

Denture adhesives are widely used by denture wearers to enhance denture retention and stability.^{1-3,5,6} In the clinic, patients would benefit greatly from a dentist's guidance in the use of denture adhesives. This study was designed to survey the knowledge, understanding and level of education about denture adhesives among dental students and dentists in China.

More than 83% of dental students said they had not heard of denture adhesives and that they didn't know what the function of a denture adhesive was. Among the dentists, approximately 50% said that they had heard only a little about denture adhesives and that they knew only a little of the function of denture adhesives. However, more than 69% of dentists and more than 93% of dental students answered that they did not know of any disadvantages of denture adhesives. Almost none of the dentists or dental students knew of any domestic or imported brands of denture adhesive. Commercial denture adhesives were developed in response to patients' requests and were manufactured without dental professional input. Advertising about denture adhesives has come mainly from the manufacturers, with the aim of increasing sales and profits. Therefore, dental professionals have had dissenting opinions about denture adhesives for a long time.^{9,10,12} However, it is important for dentists to be familiar with the disadvantages of denture adhesives, in particular the risk of resorption of the alveolus caused by inappropriate use of denture adhesives.¹¹ Professional education about denture adhesives is therefore necessary. Zhao et al.²⁴ reported that denture adhesive use has not been accepted in China, and this may be why many dentists and dental students had very limited knowledge of denture adhesives.

Between 73% and 100% of subjects responded that they had never been taught about denture adhesives, and had never seen denture adhesives in books, lecture meeting or on television. Information for dentists about denture adhesives often comes from textbooks, lectures and technical journals. In Japan, patients accepted and began using denture adhesives before the dental professional recommended them.^{25,26} However, the number of cases in which occlusal problems have occurred because of a lack of knowledge about the improper use of the denture adhesives is increasing. A question given only to the Chinese dentists was, "Have you ever taught your students about denture adhesives?". Approximately 96% of respondents said that they had never taught their students about denture adhesives. These results are consistent with those reported by Ozan et al.¹³, who found that this topic needs to be taught more thoroughly at dental schools. We suggest that it is particularly important to teach dental students about the advantages and disadvantages of denture adhesives in professional education.

Over 73% of dentists stated that they had never seen denture adhesives in the clinic. Denture adhesive use has not yet been accepted in China.²⁴ In Japan, denture adhesives have been available for many years, but their clinical use has been accepted only in recent years.^{25,26} In the past, the clinical use of denture adhesives was prohibited by dental associations in the USA and Japan. Even today, home relining materials of the cushion type are not encouraged. These attitudes may have affected the attitudes of the dental profession in China, and may be the reason why many Chinese dentists stated that they had never seen denture adhesives in the clinic. These results show that although denture adhesives are accepted by some dental professionals, general acceptance of their use in Chinese clinics is likely to take more time. There are various environmental differences between the

two groups. These differences could affect dental treatment, and could affect the use of denture adhesives.

Some limitations can be identified in this study. Firstly, indirect translation of the questionnaire from Japanese to Chinese might have influenced the results. Secondly, the sample sizes were small. Thirdly, there were significant differences in age between the two groups. Fourthly, the school environments in this study may not be representative of other schools in China due to factors such as educational setting, the training program, and geographic origin. It is unknown whether the results can be generalized to other samples; therefore, it is necessary to conduct future research in more diverse samples. Although caution should be exercised in making generalizations based on the results of this study, the questionnaire is a starting point for investigating the interest and knowledge of Chinese dentists and dental students about denture adhesives. These methods may be useful for comparing recognition of denture adhesives among other groups, and may further contribute to the evaluation of denture adhesives.

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