Dental Journal
Majalah Kedokteran Gigi

Dental Journal
(Majalah Kedokteran Gigi)
2015 December; 48(4): 177–182

Research Report

Dental student's satisfaction towards orthodontic laboratory work from RSGM Dental Laboratory

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ABSTRACT

Background: *Customer satisfaction plays an important role in the success and continuity of a business. Dental Laboratory of RSGM Faculty of Dental Medicine Universitas Airlangga provides services for Faculty of Dental Medicine, Universitas Airlangga students enrolled in a dental profession program. One of services offered is making of removable orthodontic appliances. Until now there has been no research on customer satisfaction after the appliances made in the laboratory.* ***Purpose:*** *This study was conducted to determine whether Universitas Airlangga dental students as customers were satisfied with the work of the RSGM Dental laboratory, particularly in orthodontics.* ***Method:*** *An analytic observational study was carried out on 48 Faculty of Dental Medicine Universitas Airlangga students who were enrolled in a dental profession program and made removable orthodontic appliances in RSGM Dental Laboratory. The students were asked to fill out a questionnaire about satisfaction regarding the timeliness, the suitability of results, the services provided, the quality of both active and passive components, the ease of insertion and activation. Data were analyzed descriptively. The relationship between satisfaction towards the quality of clasp, spring, bow and satisfaction towards the quality of acrylic plate to the ease of insertion were analyzed with Fischer exact test. The relationship between satisfaction towards the quality of clasp, spring, bow and satisfaction towards the quality of acrylic plate to the ease of activation were analyzed by chi square.* ***Result:*** *Respondents who were satisfied with the timeliness of work were 54.17%, the suitability of the results of the query were 79.17%, the services provided were 95.83%, the results of clasp, bow and spring were 72.92%, the results of acrylic plate were 77.08%, the ease of insertion were 54.17%, and the ease of activation were 89.58%. The results of the statistical analysis showed a significant correlation between the ease of insertion and the quality of clasp, spring and bow ($p = 0.01$) as well as acrylic plate made ($p = 0.045 < 0.05$), however, there was no significant correlation between the ease of activation with quality of clasp, spring and bow ($p = 0.08$) and the acrylic plate made ($p = 0.337$ ($p > 0.05$)).* ***Conclusion:*** *It was concluded that the majority of respondents are satisfied with the results of removable orthodontic appliances produced, but punctuality still needs to be improved.*

Keywords: *Satisfaction; dental laboratory; orthodontic appliance*

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INTRODUCTION

Customer satisfaction has long been known as one of important roles in the success and continuity of a business.[1] Dental Laboratory is one of services included in health care, which directly affects and relates to human health. Dental Laboratory of RSGM Faculty of Dental Medicine Universitas Airlangga provide services to produce appliances for prosthodontics, orthodontics and conservative dentistry. Services are provided for students of professional programs, so that the students of Faculty of Dental Medicine do not need to make their own patient's appliances. One of the facilities provided for students working in the orthodontic clinic is the making of removable orthodontic appliances. Removable orthodontic appliances consists of clasps as retention components, labial bows and springs as the active components and acrylic plate as base and supporting other components.[2] Each component must be well made, because

Dental Journal (Majalah Kedokteran Gigi) p-ISSN: 1978-3728; e-ISSN: 2442-9740. Accredited No. 56/DIKTI/Kep./2012.

DOI: 10.20473/j.djmkg.v48.i4.p177-182

the effectiveness of the active component also relies on other component.[3] If each component is well prepared, insertion of the appliances can be done easily and the activation of the springs and bow as the active component can move the teeth as expected.

Until now there has been no research on customer satisfaction after orthodontic appliances made in the Dental Laboratory of RSGM Faculty of Dental Medicine Universitas Airlangga, whereas feedback is necessary for the progress of a services in this highly competitive era. Customer satisfaction includes the difference between the expectations of the performance or results should be surveyed. Customers are satisfied when the results (outcomes) equal or exceed customer expectations.[4] In other words, customer satisfaction is a feeling obtained from the comparison between presentations or product perceived and expected. A study about the aspects of quality or quantity of products, including customer satisfaction is needed to evaluate the performance of a business. Study of customer satisfaction is often done in survey method. Survey can be done by post, telephone or personal interview such as directly reported satisfaction or direct measurement through questions.

There is an agreement between RSGM Dental Laboratory with Teknik Kesehatan Gigi (TKG) study program, whereas orthodontic work that available at the laboratory will be done by TKG students. Making removable orthodontic appliances in RSGM Dental Laboratory is free of charge, nevertheless not all of the dental students willing to give the work to that laboratory. So, this study was conducted to determine whether dental students as customers were satisfied with the work of the Dental Laboratory of RSGM Faculty of Dental Medicine Universitas Airlangga, particularly in orthodontics. It is hoped that this research can provide input to trigger corrective measures so that there will be more customers and students of TKG study program as technicians have enough practice before working in the community and dental student can have proper orthodontic appliances to treat orthodontic patients well.

MATERIALS AND METHOD

This research was conducted at orthodontic clinic of the Faculty of Dental Medicine Universitas Airlangga, on July-August 2015. This study was analytic observational with cross sectional approach. Samples were dental students of Faculty of Dental Medicine Universitas Airlangga which made orthodontic appliances in the Dental Laboratory of RSGM Faculty of Dental Medicine Universitas Airlangga. Samples was taken by total sampling technique. The number of samples that meet the criteria of this research was 48 respondents.

Measurement of respondent's satisfaction towards orthodontic appliances made in the dental laboratory was done by questionnaire survey. Respondents were asked to fill out questionnaires after receiving removable orthodontic appliances, after insertion and activation of the appliances in patients. After receiving orthodontic appliances, respondents were asked to provide an assessment of satisfaction towards orthodontic appliances made in the dental laboratory, including satisfaction with the timeliness of completion of removable orthodontic appliances, satisfaction with the suitability of conformity orthodontic appliances received with the ordered, satisfaction with the service provided, satisfaction with the result of making clasp, bow and spring as well as satisfaction with the acrylic plate produced. After respondents perform the insertion of the appliances to the patient, they were also asked to assess satisfaction with the ease of appliance insertion and activation to the patient. This questionnaire answers used the Guttman scale, where there were only two possible answers to each question, which were satisfied and not satisfied.[5]

Data were analyzed descriptively and analytically by using SPSS 16. In descriptive, the results of this study will provide an overview of student satisfaction on the results of orthodontic appliances made in the Dental Laboratory of RSGM Faculty of Dental Medicine, Universitas Airlangga. While the analytical analysis was used to examine the correlation between variables, including the relationship between student satisfaction on the results of making clasp, spring, and bows and student satisfaction for ease of insertion and activation, as well as the relationship between student satisfaction on the results of the making of acrylic plate with student satisfaction for ease of insertion and activation. Chi-square and Fischer correlation test were used in this study with significance p value ≤ 0.05.

RESULT

Of the 49 students who made orthodontic appliances in Dental Laboratory of RSGM Faculty of Dental Medicine Universitas Airlangga, a student has not done the insertion and activation yet. So that the number of samples that are eligible in this study were 48 students. Results of the analysis of questionnaire data from this study showed a picture of student satisfaction on the results of orthodontic appliances made in the Dental Laboratory of RSGM Faculty of Dental Medicine Universitas Airlangga (Table 1).

From Table 1 it can be seen that most respondents are satisfied with the results of orthodontic appliances made in Dental Laboratory of RSGM Faculty of Dental Medicine Universitas Airlangga. After receiving orthodontic appliance from the dental laboratory, respondents felt the greatest satisfaction in terms of services provided (95.83%). In the second place was satisfaction towards result suitability with the request (72.92%). In terms of timeliness, almost half of the respondents (45.83%) still feel unsatisfied with the timeliness of orthodontic appliances completion. Most respondents have been satisfied with the result of making clasp, spring and bow (72.92%) and the result of making the acrylic plate (77.08%). After insertion and activation, almost half of the respondents (45.83%) still

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feel unsatisfied with the ease of insertion, but the majority of students (89.58%) were satisfied with the ease of activation of the appliances.

Table 1. Satisfaction of students against the results of orthodontic appliances made in the Dental Laboratory of RSGM Faculty of Dental Medicine Universitas Airlangga

	Satisfaction assessment	
	Satisfied	Unsatisfied
Punctuality	26 (54.17%)	22 (45.83%)
Suitability with the order	38 (79.17%)	10 (20.83%)
Service provided	46 (95.83%)	2 (4.17%)
Quality results		
a. Making the clasps, springs and bows	35 (72.92%)	13 (27.08%)
b. Making the acrylic plate	37 (77.08%)	11 (22.92%)
Ease of insertion	26 (54.17%)	22 (45.83%)
Ease of activation	43 (89.58%)	5 (10.42%)

Table 2. Relationship of satisfaction towards the result of making clasp, spring and bow and satisfaction towards the ease of insertion

	Ease of insertion	
	Satisfied	Unsatisfied
Result of making clasps, spring and bows		
Satisfied	65.71%	34.29%
Unsatisfied	23.08%	76.92%

Table 3. Relationship of satisfaction towards the result of making clasp, bow and spring and satisfaction towards the ease of activation

	Ease of activation	
	Satisfied	Unsatisfied
Result of making clasps, spring and bows		
Satisfied	94.29%	5.71%
Unsatisfied	76.92%	23.08%

Table 4. Relationship of satisfaction towards the results of making the acrylic plate and satisfaction towards the ease of insertion

	Ease of insertion	
	Satisfied	Unsatisfied
Result of making the acrylic plate		
Satisfied	62.16%	37.84%
Unsatisfied	27.27%	72.73%

Table 2 shows the results of cross tabulation between satisfaction towards the result of making clasp, spring and bow and satisfaction towards the ease of insertion. The cross-tabulation of the results showed that the largest percentage of respondents who feel unsatisfied with the result of making clasp, bow and spring were also dissatisfied in terms of ease of insertion (76.92%). Likewise, respondents who were satisfied with the result of making clasp, bow and spring were also satisfied towards the ease of insertion (65.71%).

Statistical analysis with Fischer 'exact test in Table 2 was obtained $p = 0.01$ ($p < 0.05$), which means there was a significant correlation between satisfaction towards the result of making clasp, bow and spring and the ease of insertion. The odds ratio for 6.389 showed that the respondents were satisfied with the result of making clasp, bow and spring had the possibility satisfied with the ease of insertion 6.389 times greater than the respondents who were not satisfied with the result of making clasp, bow and spring.

Table 3 shows the results of cross tabulation between satisfaction towards the result of making clasp, spring and bow and satisfaction towards the ease of activation. The cross-tabulation of the results indicates that most respondents who satisfied with the result of making clasp, bow and spring will also satisfied towards the ease of activation (94.29%). However, the results of the cross tabulation also indicates that there was a large majority of respondents who were not satisfied with the result of making clasp, bow and spring but were satisfied towards the ease of activation (76.92%).

Statistical analysis using chi square in Table 3 was obtained $p = 0.08$ ($p > 0.05$), which means there was no significant correlation between the ease of activation to the quality of clasp, spring and bows were made. The odds ratio of 4.95 indicates that students who satisfied with the result of making clasp, bow and spring had the possibility satisfied with the ease of activation 4.95 times greater than students who were unsatisfied with the result of making clasp, bow and spring.

Table 4 shows the results of cross tabulation between satisfaction towards the results of the making of acrylic plate and satisfaction towards the ease of insertion. The cross-tabulation of the results showed that the largest percentage of respondents who feel dissatisfied with the result of making acrylic plate were also unsatisfied with

Table 5. Relationship of satisfaction towards the results of making the acrylic plate and satisfaction towards the ease of activation

	Ease of activation	
	Satisfied	Unsatisfied
Result of making clasp, spring and bow		
Satisfied	91.89%	8.11%
Unsatisfied	81.82%	18.18%

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DOI: 10.20473/j.djmkg.v48.i4.p177-182

the ease of insertion (72.73%). Likewise, respondents who were satisfied with the results of acrylic plate were also satisfied with the ease of insertion (62.16%).

Statistical analysis with Fischer's exact test in Table 4 was obtained p = 0.045 (p <0.05), which means there was a significant correlation between satisfaction towards the result of making the acrylic plate and satisfaction towards the ease of insertion. The odds ratio for 4.381 showed that the respondents were satisfied with the results of making the acrylic plate has the possibility satisfied with the ease of insertion 4.381 times greater than the respondents who were unsatisfied towards the results of making the acrylic plate.

Table 5 shows the results of cross tabulation between satisfaction towards the results of making the acrylic plate and satisfaction towards the ease of activation. The cross-tabulation of the results indicates that most respondents who satisfied with result of making the acrylic plate will also satisfied towards the ease of activation (91.89%). However, the cross-tabulation of the results showed that there was a majority of respondents who were not satisfied with results of making the acrylic plate but was satisfied towards the ease of activation (81.82%).

Statistical analysis using chi square in Table 5 obtained p = 0.337 (p>0.05), which means there was no significant relationship between satisfaction towards result of making the acrylic plate and satisfaction towards the ease of activation. The odds ratio for 2.519 showed that the respondents were satisfied with results of making the acrylic plate had the possibility satisfied towards the ease of activation 2.519 times greater than the respondents who were not satisfied with results of making the acrylic plate.

DISCUSSION

During research, the number of dental students who work in the orthodontic clinic approximately 120 people. Students who participated in this study only 49 students (total sampling) although only 48 students who met the criteria as samples. This is because students are not required to make orthodontic appliances at Dental Laboratory of RSGM Faculty of Dental Medicine Universitas Airlangga. They can give the work to another dental laboratory outside Faculty of Dental Medicine Universitas Airlangga.

From these results it can be seen that the satisfaction of students to timeliness of work were 54.17% satisfied and 45.83% dissatisfied. Although there was a higher percentage of satisfied, but not much different from dissatisfied. Timeliness of work is one of the important factors customers want. In practice, a high quality of service does not guarantee high customer satisfaction or positive behavior intention. Customers may be satisfied with the results of the work but be dissatisfied because it was not completed on time. Likewise, advanced/modern equipment owned is interesting or in accordance with customer expectations, but may not be able to compensate for the dissatisfaction due to long waiting time.[6,7]

The appliance that is not completed on time will have a negative impact, such as schedule changing for both operators and patients. It will make some difficulties because everybody has already had something else to do. Students generally also work in other clinics, and the patients as pupils also have test schedules in the school. So, a skilled laboratory technician is needed, not only doing well, but also can meet the given deadline. Maybe this timeliness factor also make many students chose another dental laboratory outside Faculty of Dental Medicine Universitas Airlangga.

Towards the question about result suitability with the request, 79.17% of respondents were satisfied and only 20.83% were unsatisfied. At the time of giving the job, respondents must fill out the forms of orders and describe the appliance design and write the information very clearly. The design was also drawn to the working model as well, in order to clarify what is required and minimize mismatch. Good communication, reading accuracy and the ability to interpret the contents of the work order were important to produce proper orthodontic appliance. Dissatisfaction can occur due to false appliance's components that are not in accordance with the order, or mistakes in interpreting the content of the work order. This will lead to the need for revision or even making a new appliance that would require additional time. Sometimes operators must make a new impression to get a new working model. A quality control is needed prior delivering the work to the customer.

Pasuraman[8] revealed 10 dimensions of service quality, ie: tangibles, reliability, responsiveness, competence, courtesy, credibility, security, access, communication, and the ability to understand customer needs. Many studies showed that the quality of service and satisfaction are different things. Quality of service is represented by cognitive judgment, while satisfaction is an affect-laden evaluation.[9] Quality of service is not only based on technical matters, but also the complex relationship between all personnel involved. Job description and responsibilities sharing should be given clearly.[10] Results showed that 95.83% of respondents were satisfied with the services provided. This showed that the personnel in charge is quite capable of implementing some of the 10 dimensions of service quality, such as: responsiveness (willingness to help customers and deliver services rapidly), courtesy (politeness, respect, attention and friendliness of the front line staff), credibility (nature honest and trustworthy), access (ease to be contacted and met), communication (giving information to customers in a language that can be understood and always listen to their complaints), and the ability to understand customer needs.

Other dimensions are: reliability (ability to provide the promised services accurately and reliably), competence (mastery of skills and knowledge required in order to provide services required), safety (assurance), and physical evidence (reality/tangibles) that highly correlated with the

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quality of the work produced. Good process is needed to achieve good quality. Quality assessment is a dynamically process.[11] Quality of orthodontic appliance can be seen from result of making clasp, spring and bow and acrylic plate. Most respondents (72.92%) satisfied with the result of making clasp, spring and bows, as well as to the resulting acrylic plate (77.08%).

Towards the question about the ease of insertion, only 54.17% respondents were satisfied, while the remaining 45.83% were not satisfied. Nonetheless, the majority (89.58%) were satisfied with the ease of activation. Statistical analysis showed that there was a significant correlation between the ease of insertion with the quality of clasp, spring and bow ($p=0.01$) as well as acrylic plate made ($p=0.045<0.05$). When active and passive components have been made properly, it is expected both insertion and activation can be done easily. However, even though the orthodontic appliance has been well made, it is still required operator's skills to do the adjustment, so that the appliance can be inserted properly in the patient. These skills are needed especially for the mandibular appliances, because patients are generally children during mixed dentition. The first permanent molars are often not fully eruption, so it is not easy to make clasp on these teeth. This factor may contribute to the decline in the percentage of respondents' satisfaction towards making clasp, spring and bow in the amount of 72.92% to only 54.17% were satisfied with the ease of insertion.

Statistical analysis using chi square showed there was no significant correlation between the ease of activation to the quality of clasp, spring and bow ($p=0.08$) as well as acrylic plate made (p 0.337 ($p>0.05$). Activation is strongly influenced by the skills of the operator. Skilled operators who are capable with wire bending techniques will be easy to do the adjustment and activation. Although the appliances have been well made, unskilled operators will also have difficulty in doing the activation. Excessive activation can make the appliances become unstable. It seems that most of the respondents already had enough skill in doing so, despite only 77.08% respondents were satisfied with the acrylic plate produced, 89.58% are satisfied with the ease of activation

Customer satisfaction leads to customer loyalty.[12] A satisfied customer will come back with more jobs and even can interested to other products.[13] The fact that 39 of 48 (81.25%) of respondents made orthodontic appliances more than 1x, indicates that most respondents are satisfied and want to make another orthodontic appliance in the Dental Laboratory of RSGM Faculty of Dental Medicine Universitas Airlangga. Dissatisfaction occurs because the performance of the product is lower than the expectations of customers. Dissatisfaction can lead customers to switch services to another dental laboratory. Students can switch to other dental laboratories that generally provide services without additional delivery charge. Dissatisfied customers usually become spreaders of the bad image that will be distributed by mouth, and give negative impacts on previous laboratory. Satisfied customer will tell 4-5 another customers. Dissatisfied customers will tell 9-10 people and 13% of unsatisfied customers will tell to more than 20 people.[14]

Strategy to increase service laboratory work can be done by monitoring and measuring customer satisfaction with administration of the questionnaire such as in this study. Dissatisfaction should be overcome with an efficient strategy for handling complaints. If the complaint is handled properly, unsatisfied customers can be changed to satisfied customers. Problems should be identified quickly and precisely to demonstrate concern towards unsatisfied customers. Other factor such as after sales service is important to provide. If there is any complaint about the orthodontic appliance, it should be well overcome by repairing or even making a new one without any charge.

It is concluded that the majority of respondents were satisfied with the results of removable orthodontic appliances produced, but Dental Laboratory of RSGM Faculty of Dental Medicine Universitas Airlangga still need to improve the timeliness, so there will be more dental students become customers and they will be facilitated enough in treating patients.

ACKNOWLEDGEMENT

Thanks for the supporting funds provided by RKAT Faculty of Vocation Universitas Airlangga 2015 No. 001/ UN3.1.15.LT/2015

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Dental Journal (Majalah Kedokteran Gigi) p-ISSN: 1978-3728; e-ISSN: 2442-9740. Accredited No. 56/DIKTI/Kep./2012.

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