

Patient's Expectation and Perception for Preorthodontic Treatment Consultation: A Study in a Dental School

Abstract

Objectives: The aim of the study is to explore the desired expectation (DE), adequate expectation (AE), zone of tolerance (ZoT), and perceived level (PL) from the patients attending a preorthodontic treatment consultation at Orthodontic Clinic, Dental School, Prince of Songkla University, Thailand. **Materials and Methods:** A total of 170 patients aged 15 years and older were asked to express their DE and AE before the consultation and to give their PL after the consultation. Two sets of questionnaires were used in this study. The first set was designed to gain data regarding general information and the measured level of expectation. The second set was used to measure the PL of patients after the preorthodontic consultation. Both questionnaires contained four dimensions of the service: Dentist's courtesy, dentist's care and examination, dentist's communication, and convenience of the services. **Results:** The communication dimension especially information regarding the orthodontic treatment need got rather low PL compared to others. **Conclusion:** The information regarding the orthodontic treatment need was the main item that patients need to receive in the consultation.

Keywords: Adequate expectation, desired expectation, perceived level, preorthodontic treatment consultation, zone of tolerance

Introduction

The process of orthodontic treatment usually takes a long time. Patients frequently seek orthodontic treatment due to the esthetic.^[1-4] It is not a need, but rather an option of treatment compared to other health treatments. Many risks may occur during or after orthodontic treatment.^[5-7] To achieve orthodontic treatment plan, various views of radiograph and study model are required. These are expenses before starting the treatment. Therefore, the tentative diagnosis and primary treatment plan are recommended before essential supplemental diagnostic data are gained to the final orthodontic treatment plan. This process corresponds to the preorthodontic consultation which is the first step in clinical practice guideline for orthodontic treatment.^[8-10] In addition, it is included in one step of the orthodontic treatment proposed by orthodontic quality assurance as well.^[11] In the process of preorthodontic treatment consultation, patients' motivation and chief complaint are the main issues that the orthodontists need to know. Both extra- and intra-oral

examinations are required to provide for the tentative diagnosis and primary treatment plan. The information that the patients should understand at preorthodontic treatment consultation includes what they have to do during orthodontic treatment, patient malocclusion, need for orthodontic treatment, treatment process, possible risks, and treatment fee.^[10]

Dental School, Prince of Songkla University (PSU) is the only dental school located in the southern of Thailand. The aim of preorthodontic treatment consultation activities at the faculty is not only to provide service for patients but also to teach dental students and orthodontic residents. The patients receive preorthodontic treatment consultation mainly from the final year dental students, the residents in orthodontic training or the orthodontic staffs. In the process of undergraduate teaching, the consultation is reexamined by senior residents or orthodontic staffs.

The evaluation of the service is one of the processes facilitating the improvement of the different areas of this dental school and also the profession. It was shown that patient

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compliance such as appointment keeping and intention to comply with recommended treatment linked with the satisfaction of health-care management.^[12] However, satisfaction is related to expectation and perception. By the definitions, a person's expectation is "strong beliefs that something will happen," perception is "the recognition of thing using his senses" and "satisfaction is the pleasure that a person feels when he/she does something or gets something."^[13] Newsome and Wright^[12] classified patients' expectation in dental service into seven dimensions; care, courtesy, communication, comfort, cost, convenience, and clues.

For many years, there were numerous surveys on the patients' expectation and satisfaction in dental service from different samples, sites and time both in qualitative and quantitative measures. These quantitative surveys used the constructed questionnaire with different scales for measuring of these data which were abstract and subjective. Zone of tolerance (ZoT) model introduced by Parasuraman and others^[15] is one of the methods that has been used in marketing. It was also recommended by Newsome and Wright^[12] that this model is appropriated to be used in health-care service. This model allows the clients to identify both desired expectation (DE) and adequate expectation (AE) levels. DE is the level of the service which the customer wishes to receive. Whereas AE is the minimum level of the service that the customer can accept.^[12,14,15] The range between desired and AE is called "ZoT" [Figure 1]. Narrow and high level in the ZoT suggests more important of that aspect or the service.^[12] ZoT can be used to explain how critical for the aspect of the service that has to be improved. To the best of our knowledge, this is the first study focusing on patients' expectation and perception in preorthodontic treatment consultation in Dental School by using ZoT model.

Materials and Methods

The population included new orthodontic patients aged more than 15 years old and older from the Orthodontic Clinic, PSU, Thailand. The sample size was calculated using formulation of known population size with the proportion of 0.5, getting the sample size of 168. A total of 170 samples were recruited by accidental sampling method. Two sets of questionnaires were constructed. The first set was regarding the general characteristics, level of DE, and AE of the service. The second set was intended to draw only PL after receiving the service. The



Figure 1: Zone of tolerance model (modified from Parasuraman *et al.*)^[15]

questions regarding the qualities of the service were the same in both sets. Four dimensions: Dentist's courtesy, dentist's care and examination, dentist's communication, and convenience of the services were used to explore the level of patient expectation and perception in the preorthodontic treatment consultation. These four dimensions were modified from seven dimensions of patient's expectation in dental service by Newsome and McGrath.^[14] Each dimension contained several subitems as shown in Table 1. The subitems in communication dimension were regarding to the performance of the dental students or dentists and the information that the patients should receive. These information were considered from the guideline and the problems related to the knowledge and attitude of patients from previous studies. The scale of measurement ranged from 1 to 10 from the lowest to the highest. The content validity of both sets of the questionnaires was examined by three orthodontic experts. After that, the reliability of the questionnaires was done on 10 new orthodontic patients at the orthodontic clinic. The questionnaires were revised and retested until the Cronbach's alpha coefficient reached to 0.90–0.98.^[16] The patients were asked to express their levels of DE and AE in the first set of questionnaire before receiving preorthodontic treatment consultation. After the service, the patients were asked to grade their perceptions on the second set of questionnaire. The study was approved by Research Ethic Committee, Faculty of Dentistry, PSU No. 0521.1.03.

Results

The total sample size comprised of 33 males and 137 females. The majority of the sample (49.5%) was in the ages of 15–20 years old. More than half of the sample was university students or finished at least bachelor degree. Most samples gained the income approximately 10,000–19,000 baht per month which is about 300–400 US dollars [Table 2].

Figure 2 shows that ZoT of each subitem in the dentist's courtesy dimension was similar. The samples expressed the highest DE level (9.19 ± 0.79) on gentleness of dentists. The PL of gentleness (9.07 ± 0.91) was very close to the DE. Difference between DE (8.99 ± 0.91) and PL (8.80 ± 0.98) in friendliness of dentists was the largest in this dimension. Interestingly, the polite invitation to the dental unit had PL (8.86 ± 1.00) higher than its DE (8.75 ± 0.99) indicating the patients' satisfaction.

ZoT of each subitem in dentist's care and examination dimension was also similar (ZoT = 3.44 ± 2.27 – 3.50 ± 2.36) [Figure 3]. In addition, the levels of expectation and perception in each subitem of this dimension were nearly equal. Careful intra- and extra-oral examination and spending appropriate time for the examination showed high DE level (9.08 ± 0.86 and 9.00 ± 0.92 , respectively). Interestingly, the PL of the

Table 1: Four-dimensions of patients' expectation and their subitems

| Dentist's courtesy | Dentist's care and examination | Dentist's communication | Convenience of the service |
|----------------------------------|---|---|---|
| Gentleness | Careful intra- and extra -oral examination | Willingness to answer patients' question | Comfortable and sufficient waiting area |
| Friendliness | Spending appropriate time for the examination | Using ordinary words in the conversation (not dental term) | Careful instruction by receptionist before receiving consultation |
| Polite invitation to dental unit | Attention to patients' malocclusion | Allow patients to give signal when feeling uncomfortable | Privacy of dental unit |
| | Attention to patients' other dental problems | Allow patients to ask questions about malocclusion and other dental problems | |
| | | Providing information about what patients have to do during orthodontic treatment | |
| | | Providing information about patients' malocclusion | |
| | | Providing information about reason and consequence of treatment | |
| | | Providing information about possible orthodontic treatment process | |
| | | Providing information about possible risks and complications from orthodontic treatment | |
| | | Providing information about treatment fee | |

Table 2: Demographic data of the samples

| Demographic data | n (%) |
|--|------------|
| Sex (n=170) | |
| Male | 33 (19.4) |
| Female | 137 (80.6) |
| Education (n=170) | |
| Primary-secondary education | 13 (7.7) |
| High school education | 30 (17.6) |
| Vocational certificate-higher vocational certificate | 30 (17.6) |
| Studying for bachelor degree, finished bachelor degree or higher | 97 (57.1) |
| Age (n=170), years | |
| 15-20 | 78 (49.5) |
| 21-30 | 68 (40.0) |
| 31-40 | 17 (10.0) |
| ≥41 | 7 (4.1) |
| Occupation (n=170) | |
| Students | 106 (62.4) |
| Government officers | 21 (12.4) |
| Government employee/casual workers | 15 (8.8) |
| Others | 28 (16.4) |
| Income per month (n=161), baht | |
| <10,000 | 39 (24.2) |
| 10,000-19,999 | 65 (40.4) |
| 20,000-29,999 | 30 (18.6) |
| >30,000 | 27 (16.8) |

service was the lowest (PL = 8.49 ± 1.12) in the subitem of attention to patients' other dental problems. Meanwhile, patients were satisfied with attention to the patients' malocclusion (PL = 8.80 ± 1.13, DE = 8.82 ± 0.89).

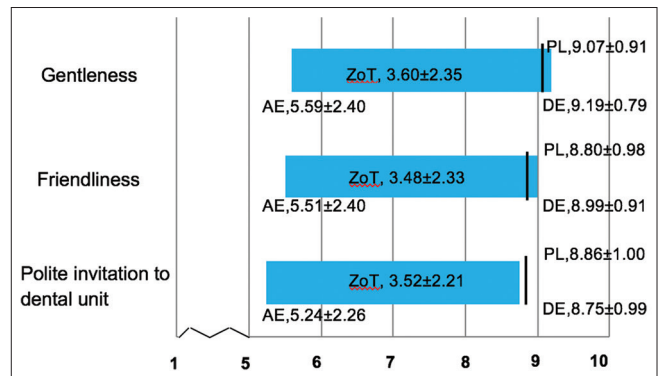


Figure 2: Average values and standard deviation of desired expectation, adequate expectation, zone of tolerance and perceived level in the dimension of dentist's courtesy

In communication dimension, ZoT was not different in each subitem [Figure 4]. The narrowest ZoT was found on the subitems of information about the need for orthodontic treatment (ZoT = 3.31 ± 2.34) and possible during and after treatment (ZoT = 3.32 ± 2.22). Contrary to ZoT, the PL were much varied in each subitem. Subitem of willingness to answer patients' questions had the highest PL (8.77 ± 1.11), whereas subitem of providing information about approximate treatment time and fee obtained the lowest PL (7.84 ± 1.57).

Similar to other dimensions, ZoT of the 3 subitems in the dimension of the convenience of the services were not different [Figure 5]. Careful instruction by receptionist before receiving consultation showed the lowest PL (8.16 ± 1.37). Privacy of dental unit, as well

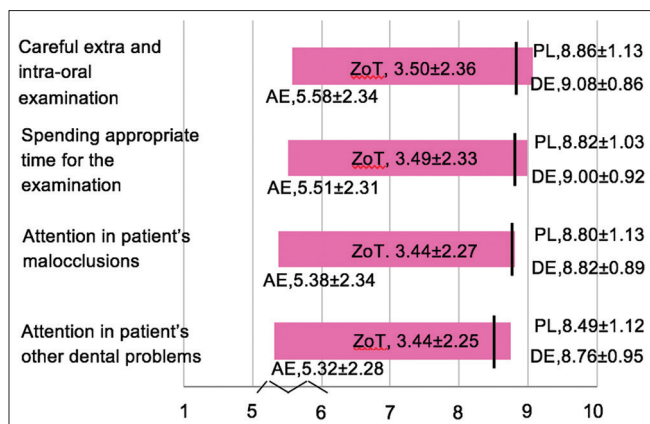


Figure 3: Average values and standard deviation of desired expectation, adequate expectation, zone of tolerance and perceived level in the dimension of dentist's care and examination

as comfortable and sufficient waiting area, received the highest PL (8.64 ± 1.19 and 8.62 ± 1.10 , respectively) and they were higher than the DE level (8.57 ± 1.15 and 8.66 ± 1.20 , respectively) indicating patients were very satisfied with these services.

Overall, ZoT in all dimensions was not much different. In general, the samples reported high PL which most of them were higher than their AE levels but lower than DE levels. Exceptionally, subitems of polite invitation to dental unit, comfortable and sufficient waiting area, and privacy of dental unit obtained higher PL than both desired and AE. It is interesting that PL were rather low in the subitems of dentist communication dimension that were mainly related to the information provided by dentists.

Discussion

This study was conducted in the dental school, which is primarily not focusing on profit of the service. Most of the samples in this study were university students and in the late teenage group. The incomes of the samples were rather low to moderate. Therefore, the results of the study will be useful for the service that have similar characteristics. However, it can be beneficial for other settings after careful revise.

This study found that dentist's courtesy dimension showed high average PL regarding to gentleness and friendliness of the dentists. This finding is also the concordance with the previous study^[17] in this dental school in 2000 which found that patients had high satisfaction with the dental student's courtesy. Nevertheless, it received lower PL than DE, while the polite invitation to dental unit got higher PL than DE. For the highest standard of the gentleness and friendliness of the service provider, special training should be emphasized during the training program for dental students and orthodontic residents.

Regarding to the dentist's care and examination dimension, it was found that patients placed high DE on careful intra- and extra-oral examination and spending appropriate

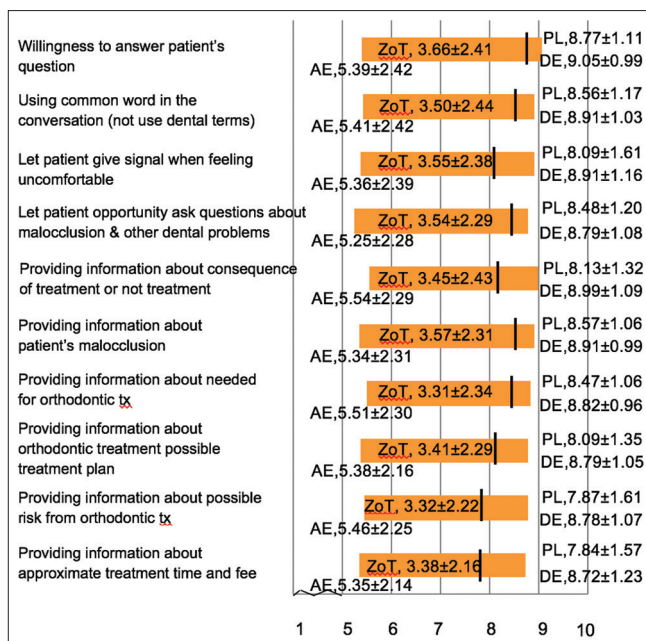


Figure 4: Average values and standard deviation of desired expectation, adequate expectation, zone of tolerance and perceived level in the dimension of dentist's communication

time for the examination. This result corresponded with the study^[18] in the Dental School, Athens University, Greece, which found that careful oral examination and proper diagnosis received high expectation from the patients. However, it is quite hard to justify how much time is appropriate in each dental operation; some patients may feel that the dentists who use longer time are not professional capability. It is surprising that the PL in subitem of attention to the patient malocclusion was almost equal to DE. This phenomenon reflects on the need of improvement since this evaluation was done in the orthodontic clinic with the consultation form. Therefore, the details regarding to malocclusion would be examined carefully. The subitem of attention to other dental problems showed the highest difference between PL and DE. This result suggested that orthodontists and dental students must also pay attention to other dental problems besides patients' malocclusion. This awareness is the main responsibility of all dentists and orthodontists who work in the orthodontic clinic.

Dentist's communication dimension had 10 subitems. Four items concerned with the process and the rest was the information related to orthodontic treatment that should be provided to the patients. Comparing to other dimensions, the results revealed that patients had high DE level and low PL on almost the subitems in this dimension. The results of this study were similar to the studies in dental services in Greece,^[18] Finland,^[19] United Arab Emirates,^[20] and Turkey^[21] which showed high expectation and dissatisfaction of the patients for the communication skill. The rest subitems in this dimension were related to provide information on orthodontic treatment, such as what patients have to do

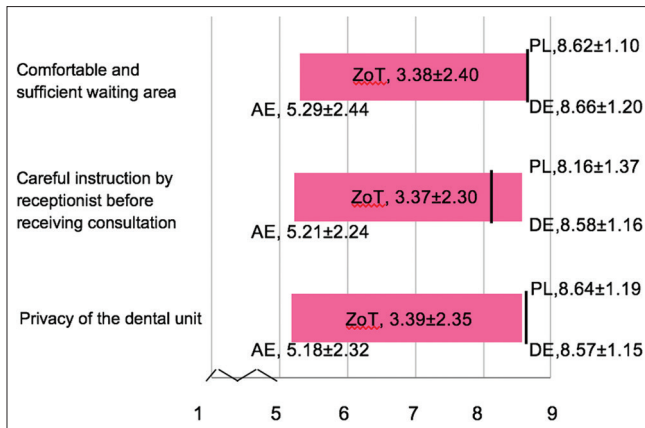


Figure 5: Average values and standard deviation of desired expectation, adequate expectation, zone of tolerance and perceived level in the dimension of convenience of the service

during orthodontic treatment, patient malocclusion, reason for orthodontic treatment, treatment process, possible risks, and complications that may happen during treatment. These subitems got lower PL than DE level, showing that the dental students or residents might not have enough time to explain or did not have enough knowledge. Therefore, these information should be put in the guideline and taught during undergraduate course and orthodontic training. It is not surprising that patients also gave lower PL than DE in the subitem of treatment fee, this may imply that treatment fee may be one of the motivations that induce patients decide to have orthodontic treatment at this dental school. These results support the previous notion that communication skill in health-care service is one of the main factors influencing patients' satisfaction. Several methods as simulated patient, case-based scenario, videotape interview and class role play, can fulfill the training of the communication skill for dental students and residents.^[22]

The dimension of convenience of the services was composed of the physical structures of the waiting area and the dental unit, as well as the receptionist of the clinic. Careful instructions from the reception showed the lowest PL among others. Therefore, the receptionist is one of the important persons for the high-quality service and is needed to improve. The higher PL the DE was found on the privacy of dental unit due to the design of the clinic with the partition in each dental unit. The height of the partition in this clinic is about the average Thai shoulder.

Even though the results of this study showed ZoT in each subitem were not different, and most of the PL were in the range of ZoT. It was accepted that ZoT can be used in the evaluation on dental care service.

Conclusion

This study was conducted in the academic setting and involved in not only the orthodontists but also the dental students. The results suggested that dental curriculum

should include the guideline for good preorthodontic treatment consultation and focus on human skills especially communication skills. In addition, more information on orthodontic treatment should be available through various media and venues. The results from this study can be used for improving the services and establishing more appropriate guidelines for preorthodontic treatment consultation in Thailand. Moreover, it is not only to provide good quality of service but also to meet the patient's expectation, and to increase patient's satisfaction.

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Nil.

Conflicts of interest

There are no conflicts of interest.

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Questionnaire number [] [] [] []

Date.

Part 1: General data and expectation of service

1. Gender []
(1) male (2) female
2. Date of birth:.
3. Level of education []
(1) Primary – secondary school education
(2) High school education
(3) Vocational certificate, higher vocational certificate
(4) Studying for bachelor degree, finished bachelor degree or higher
4. Occupation []
(1) Students
(2) Government officers
(3) Government employees/casual workers
(4) Others.
5. Income per month []
(1) <10,000 Baht
(4) 10,000–19,999 Baht
(2) 20,000–29,999 Baht
(3) ≥30,000 Baht

Questionnaire number [] [] []

Date.

Part 1: Level of patients' expectation before orthodontic consultation

Introduction for patients to fill in the questionnaire

- Desired expectation means the highest level that you expect from the service
- Adequate expectation means the acceptable level of the service

Please circle around number represented your level of expectation

| Dimension of expectation and subitems | Desired expectation | | Adequate expectation | |
|---|----------------------|-----|----------------------|-----|
| | Min | Max | Min | Max |
| I Dentist's courtesy | | | | |
| 1. Gentleness of dentist | 1 2 3 4 5 6 7 8 9 10 | | 1 2 3 4 5 6 7 8 9 10 | |
| 2. Friendliness of dentist | 1 2 3 4 5 6 7 8 9 10 | | 1 2 3 4 5 6 7 8 9 10 | |
| 3. Politely invitation to dental unit by dentist | 1 2 3 4 5 6 7 8 9 10 | | 1 2 3 4 5 6 7 8 9 10 | |
| II Dentist's care and examination | | | | |
| 4. Carefully intra- and extra-oral examination | 1 2 3 4 5 6 7 8 9 10 | | 1 2 3 4 5 6 7 8 9 10 | |
| 5. Spending appropriate time for examination | 1 2 3 4 5 6 7 8 9 10 | | 1 2 3 4 5 6 7 8 9 10 | |
| 6. Attention to patient's malocclusion | 1 2 3 4 5 6 7 8 9 10 | | 1 2 3 4 5 6 7 8 9 10 | |
| 7. Attention to patient's other dental problems | 1 2 3 4 5 6 7 8 9 10 | | 1 2 3 4 5 6 7 8 9 10 | |
| III Dentist's communication | | | | |
| 8. Willingness to answer patient's question | 1 2 3 4 5 6 7 8 9 10 | | 1 2 3 4 5 6 7 8 9 10 | |
| 9. Using ordinary words in the conversation (not dental terms) | 1 2 3 4 5 6 7 8 9 10 | | 1 2 3 4 5 6 7 8 9 10 | |
| 10. Allow patients to give signal when feeling uncomfortable | 1 2 3 4 5 6 7 8 9 10 | | 1 2 3 4 5 6 7 8 9 10 | |
| 11. Allow patients to ask questions about malocclusion and other dental problems | 1 2 3 4 5 6 7 8 9 10 | | 1 2 3 4 5 6 7 8 9 10 | |
| 12. Providing information about what patients have to do during orthodontic treatment | 1 2 3 4 5 6 7 8 9 10 | | 1 2 3 4 5 6 7 8 9 10 | |
| 13. Providing information about patient's malocclusion | 1 2 3 4 5 6 7 8 9 10 | | 1 2 3 4 5 6 7 8 9 10 | |
| 14. Providing information about reason and consequence of orthodontic treatment | 1 2 3 4 5 6 7 8 9 10 | | 1 2 3 4 5 6 7 8 9 10 | |
| 15. Providing information about possible orthodontic treatment process | 1 2 3 4 5 6 7 8 9 10 | | 1 2 3 4 5 6 7 8 9 10 | |
| 16. Providing information about possible risks and complications from orthodontic treatment | 1 2 3 4 5 6 7 8 9 10 | | 1 2 3 4 5 6 7 8 9 10 | |
| 17. Providing information about treatment fee | 1 2 3 4 5 6 7 8 9 10 | | 1 2 3 4 5 6 7 8 9 10 | |
| IV Convenience of the service | | | | |
| 18. Comfortable and sufficient of waiting area | 1 2 3 4 5 6 7 8 9 10 | | 1 2 3 4 5 6 7 8 9 10 | |
| 19. Careful instructions by receptionist before receiving the consultation | 1 2 3 4 5 6 7 8 9 10 | | 1 2 3 4 5 6 7 8 9 10 | |
| 20. Privacy of dental unit | 1 2 3 4 5 6 7 8 9 10 | | 1 2 3 4 5 6 7 8 9 10 | |

Part 2: Level of patients' perception of the service**Please circle around the number represented your level of perception**

| Dimension of expectation and subitems | Perceived level | |
|---|----------------------|-----|
| | Min | Max |
| I Dentist's courtesy | | |
| 1. Gentleness of dentist | 1 2 3 4 5 6 7 8 9 10 | |
| 2. Friendliness of dentist | 1 2 3 4 5 6 7 8 9 10 | |
| 3. Polite invitation to dental unit | 1 2 3 4 5 6 7 8 9 10 | |
| II Dentist's care and examination | | |
| 4. Careful intra- and extra-oral examination | 1 2 3 4 5 6 7 8 9 10 | |
| 5. Spending appropriate time for examination | 1 2 3 4 5 6 7 8 9 10 | |
| 6. Attention to patient's malocclusion | 1 2 3 4 5 6 7 8 9 10 | |
| 7. Attention to patient's other dental problems | 1 2 3 4 5 6 7 8 9 10 | |
| III Dentist's communication | | |
| 8. Willingness to answer patient's question | 1 2 3 4 5 6 7 8 9 10 | |
| 9. Using ordinary words in the conversation (not dental terms) | 1 2 3 4 5 6 7 8 9 10 | |
| 10. Allow patients to give signal when feeling uncomfortable | 1 2 3 4 5 6 7 8 9 10 | |
| 11. Allow patients to ask questions about malocclusion and other dental problems | 1 2 3 4 5 6 7 8 9 10 | |
| 12. Providing information about what patients have to do during orthodontic treatment | 1 2 3 4 5 6 7 8 9 10 | |
| 13. Providing information about patient's malocclusion | 1 2 3 4 5 6 7 8 9 10 | |
| 14. Providing information about reason and consequence of orthodontic treatment | 1 2 3 4 5 6 7 8 9 10 | |
| 15. Providing information about possible orthodontic treatment process | 1 2 3 4 5 6 7 8 9 10 | |
| 16. Providing information about possible risks and complications from orthodontic treatment | 1 2 3 4 5 6 7 8 9 10 | |
| 17. Providing information about treatment fee | 1 2 3 4 5 6 7 8 9 10 | |
| IV Convenience of the services | | |
| 18. Comfortable and sufficient of waiting area | 1 2 3 4 5 6 7 8 9 10 | |
| 19. Careful instructions by receptionist before receiving the consultation | 1 2 3 4 5 6 7 8 9 10 | |
| 20. Privacy of dental unit | 1 2 3 4 5 6 7 8 9 10 | |