

Importance-Performance Analysis of Dental Satisfaction Among Three Ethnic Groups in Malaysia

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Purpose: To find the differences in patient satisfaction related to dental services among three ethnic groups – Chinese, Indian and Malay – at AIMST University Dental Centre and analyse them with an importance-performance grid, identifying the weak and strong points, in order to provide better service.

Materials and Methods: This questionnaire-based study consisted of convenience samples of 174 patients of Chinese, Indian and Malay ethnicity. Importance-performance analysis for 20 attributes were compared using Likert's scale. The data obtained were statistically analysed using the Kruskal-Wallis test.

Results: Chinese and Indians both emphasised low performance on the interpersonal relationship attribute in terms of the receptionist's courtesy, whereas the Malay participants were concerned with convenience attributes. All the ethnic groups favoured maintaining existing major attributes towards technical competency, interpersonal relationship and facility factors. This study demonstrated priority differences between the ethnic groups' perception of the quality of dental services, where ethnic Chinese showed the highest gap (measure of dissatisfaction) between importance and performance compared to ethnic Malays, followed by ethnic Indians.

Conclusion: The patients from the three major ethnic groups of Malaysia were generally well satisfied. Perhaps more priority should be placed on improving the interpersonal relationship attribute, especially with the receptionists.

Key words: ethnicity, expectation, health care, importance-performance analysis, perception, quality service

Oral Health Prev Dent 2013;11:131-139
doi: 10.3290/j.ohpd.a29735

Submitted for publication: 23.02.12; accepted for publication: 22.05.12

The population of Malaysia comprises the three major ethnic groups of Asia: the Chinese, Indians and Malays. In peninsular Malaysia (where 80% of the population resides), about 61.1% are Malays (Department of Statistics, 2001). The Malays, together with a small group of the other indigenous peoples, are known as the Bumiputra, or 'sons of the soil'. The Chinese and Indians make up about 27.4% and 9.4% of the population of peninsular Malaysia, respectively. They are the descendants of migrants from China and India in the early years of the 20th century. The remaining 0.7% are 'others'. Each ethnic community has maintained its own sociocultural way of life and is segre-

gated to some extent by place of residence, education and occupation.

AIMST University is a private university located in Kedah State of Malaysia, which has taught dentistry and offered dental health services to the public since 2005. The cost of the dental services is subsidised by the university and the treatment is provided by dental students. Appointments with the students are made for the patients based on treatment required, time preference of each patient and the students' schedule in the clinics. Although free treatment is given to the patients by students, the dental service quality should be maintained; little information related to dental patients' satisfaction is available, as the dental hospital has catered to the public just since 2005.

Patients' satisfaction with the health care provided is an important aspect in assessing the quality of care (Levin, 2004); thus, patient satisfaction surveys are widely used to judge service quality (Liffe et al, 2008). One of the major issues in careful monitoring of consumer satisfaction is recognition of the complex relationship between patients' view of a health care system and their health and

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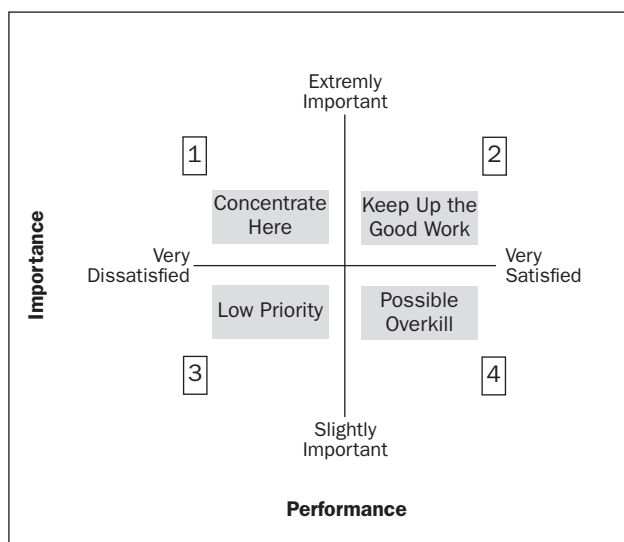
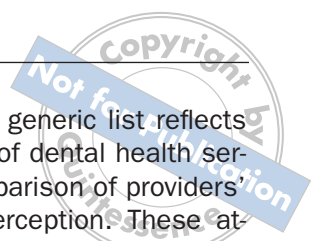


Fig 1 Importance-performance grid.

illness behaviour (Schouton et al, 2003). Clinicians may be particularly important in patient satisfaction surveys, as they communicate regularly with their patients and hear their concerns (Cleary, 1999).

Satisfaction surveys have been widely used as a management tool to address the problem of access and performance (Miranda et al, 2010). Indeed, healthcare providers are increasingly offering higher service quality to satisfy patients, and the multidimensional concept of ‘patient satisfaction’ reflects patients’ expectations, values and experiences (Sitzia and Wood, 1997; Mascarenhas, 2001). Dental care deals with five generic lists that affect patient satisfaction, namely 1. technical competence; 2. interpersonal factors; 3. convenience; 4. cost; 5. facilities (Newsome and Wright,

1999). Each attribute in each generic list reflects the most absolute dimension of dental health service and facilitates direct comparison of providers’ performance and patients’ perception. These attributes are equivalent to the service quality dimensions described by Parasuraman and Berry, i.e. reliability, responsiveness, assurance, empathy and tangibles (Parasuraman and Berry, 1988). In this study, only the cost issue been eliminated, as the dental services are fully subsidised by the university and free for patients.

Therefore, this study performed an ‘Importance-Performance Analysis’ (IPA) to explore and identify the importance of various dental service attributes based on four issues that affect dental patient satisfaction in our university and evaluate how well the service is performed, aiming to better position and improve the organisation of dental services. Importance-performance analysis is a research technique that helps organisations measure consumer’s attitudes toward salient products or service attributes (Hawes and Rao, 1985). The approach is summarised in a two-dimensional grid as shown in Fig 1. The data are then mapped into four quadrants (Martilla and James, 1977). The vertical axis of the grid indicates customers’ appraisal of the importance of a given attribute. The horizontal axis indicates customers’ evaluation of an organisation’s performance on a given attribute.

Patients’ importance and performance values are plotted on the grid. These values are then assessed based on the grid quadrant in which they fall. Quadrant 1 is labeled ‘Concentrate Here’, indicating that the existing dental services require urgent corrective action and thus should be given top priority. An item in quadrant 2, labeled ‘Keep up the good work’, infers that the existing dental services have strengths and should be maintained. The third

Table 1 Distribution of sociodemographic variables among the 3 ethnic groups

| Ethnic Group | Gender | | Marital status | | Age (in years) | | | | | |
|--------------|--------|--------|----------------|-----------|----------------|-------|-------|-------|-------|------|
| | Male | Female | Married | Unmarried | 11–20 | 21–30 | 31–40 | 41–50 | 51–60 | >60 |
| China | 24 | 39 | 37 | 26 | 17 | 12 | 1 | 13 | 10 | 10 |
| India | 21 | 35 | 35 | 21 | 10 | 13 | 11 | 13 | 7 | 2 |
| Malay | 25 | 30 | 20 | 35 | 20 | 10 | 8 | 8 | 6 | 3 |
| Total | 70 | 104 | 92 | 82 | 47 | 35 | 20 | 34 | 23 | 15 |
| Percentage | 40.2 | 59.7 | 52.8 | 47.2 | 27.0 | 20.1 | 11.4 | 19.5 | 13.2 | 8.62 |

quadrant is labeled 'Low Priority', which means that these dental service attributes do not pose a threat; they may be candidates for discontinuation. Finally, quadrant 4 – called 'Possible overkill' – suggests insignificant strength and that the resources invested here may be better diverted elsewhere (Martilla and James, 1977).

Commitment to provide high-quality service and achieve patients' satisfaction is an important issue for dental healthcare providers. The purpose of this study was to find the differences in patient satisfaction related to dental services among three ethnic groups, i.e. Chinese, Indian and Malay, at AIMST University Dental Centre and to analyse the responses using the importance-performance grid.

MATERIALS AND METHODS

This questionnaire-based study was divided into two parts. The first part of the questionnaire contained questions relating to patients' sociodemographic data. The second part was designed to measure the patients' perception and expectations based on 20 attributes from four generic lists (see above), i.e. technical competence, interpersonal factors, convenience and facilities. These attributes were compared to assess importance, performance and the gap between the two among the ethnic groups (the larger the gap, the more dissatisfied). The questionnaire consisted of positive statements scored on a 5-point Likert scale: 5 = strongly agree/important, 4 = agree/important, 3 = not sure, 2 = disagree/unimportant, and 1 = strongly disagree/unimportant. Each statement measures perception and expectation.

On average, 250 patients per month utilised dental services provided by AIMST University Dental

Centre. After obtaining clearance from the Institutional Ethics Committee, literate dental patients at the AIMST University dental clinic were chosen to participate in this study. The questionnaire was made available in two languages, English and Bahasa Malaysia, and the participants were allowed to choose one. A front-to-back translation of the survey questionnaire was checked twice and validity was tested on 20 patients; a few corrections were made to the Bahasa Malaysia version before the official start of the survey. The aims and objectives of the study were explained to the participants before handing out the self-explanatory questionnaire. Only literate patients above 13 years of age were included in the study. A convenience sample of 174 patients in total from three ethnic groups (63 Chinese, 56 Indian and 55 Malay) gave consent and filled out the questionnaire. Eight incomplete survey forms were eliminated from data analysis.

The data obtained were analysed using non-parametric one-way Kruskal-Wallis analysis of variance:

$$H = \frac{12}{N(n+1)} \sum_{j=1}^k \frac{R_j^2}{n_j} - 3(N+1)$$

where k = number of samples, R_i = rank of the sample to the i , $N = \sum n_j$ = number of cases in all the samples, n_j = number of cases in the sample to the j . Significance was set at $P < 0.05$, with a 95% confidence level ($\alpha = 0.05$).

The descriptive method is used to map on the IPA grid. Perception can be determined from the performance (x-axis) given by the dental staff – students, dental surgery assistants and receptionists – based on the patient's experience. Expectation can be measured from the importance (y-axis) of each question, based on the patient's opinion.

RESULTS

The study sample consisted of a total of 174 subjects; the sociodemographic data are given in Table 1. The study population consisted of 59.7% females and 40.2% males, with a total of 63 Chinese, 56 Indians and 55 Malays. 52.8% of the study population was married and 47.2% were unmarried. The 27% of study participants were in their second decade of life, 20.1% in their third (20.1%), 19.5% in their fifth, 13.2% in their sixth, 11.4% in their fourth and 8.62% were senior citizens. A low proportion (2.8%) of the study population were post-graduates (Master's degree); slightly more than one-third had completed their secondary edu-

| Not Educated | Educational level | | | | |
|--------------|-------------------|-----------|---------------------|-----------------------------|-----------------|
| | Primary | Secondary | High-school diploma | College/University graduate | Post-Graduation |
| 3 | 7 | 24 | 11 | 16 | 1 |
| 1 | 5 | 23 | 12 | 12 | 3 |
| 2 | 6 | 18 | 7 | 21 | 1 |
| 6 | 18 | 65 | 30 | 49 | 5 |
| 3.4 | 10.3 | 37.3 | 17.2 | 28.1 | 2.8 |

| Ethnicity | No. of Samples | Median | Avg. Rank |
|---|----------------|--------|-----------|
| Chinese | 60 | 4 | 100.55 |
| Indian | 56 | 1.5 | 76.99 |
| Malay | 55 | 2 | 79.30 |
| Total | 171 | 2 | |
| H (corrected for ties)= 8.237; degree of freedom (df) = 2, $P = 0.0163$. | | | |

cation, followed by graduates (Bachelor's degree) constituting 28.1% of the study population.

The results of the Kruskal-Wallis test showed significant differences in importance (expectation) and performance (perception) between the three ethnic groups, with $P = 0.0163$ (Table 2). The Chinese ethnic group (mean rank 100.55) had the highest gap between perception and expectation, compared to Malays (79.30) and Indians (76.99).

Table 3 illustrates the gaps between the patients' perception and expectation for each ethnic group. For ethnic Chinese, the highest gap was shown in attribute number 20 about the parking area (facilities list); Indian patients showed the largest gap in attribute number 15 (convenience list), which mentioned extended treatment periods. The largest gap for ethnic Malays concerned attributes number 16 and 17 (facilities list) – the cleanliness of the reception area and the air conditioning were the most dissatisfying items.

In addition, meaningful insights were gathered from the quadrant presentation of the IPA grid for each ethnic group (Chinese, Fig 2; Indian, Fig 3; Malays, Fig 4). 'Concentrate Here', as in quadrant 1, infers that the importance is high, but performance is low. It indicates that the existing dental service urgently requires corrective action and thus should be given top priority. Attributes 9 and 20 in the Chinese ethnic group (Fig 2), attributes 9 and 10 among Indians (Fig 3) and only attribute 12 in the Malay group (Fig 4) belonged to this category.

Quadrant 2 – 'keep up the good work' – indicates high importance and high performance, i.e. the existing dental service has strength and should be maintained. Attributes 1, 2, 3, 7, 8, 16, 17, 18 and 19 for the Chinese (Fig 2), attributes 1, 2, 3, 6, 7, 8, 16, and 18 for Indians (Fig 3) and attributes 1, 3, 6, 7, 8, 16, 17, 18 and 19 for Malays were under quadrant 2 (Fig 4).

The third quadrant is 'low priority', the category of low importance and low performance. In our study, the ethnic Chinese perceived attributes 5, 10, 11, 12, 13, 14 and 15 (Fig 2) as having low performance and low importance. The results for the Indian ethnic group were different, that is, attributes 4, 5, 13, 14, 15 and 19 fall into this quadrant (Fig 3). However, according to Malay patients, attributes 5, 9, 10, 11, 13, 14, 15 and 20 were placed in the third quadrant (Fig 3).

Finally, quadrant 4, 'possible overkill' represents low importance and high performance. The Chinese group only placed attribute 4 in this quadrant (Fig 2), which suggests insignificant strength and a possibility that the resources invested should be diverted elsewhere. For Indian patients, the results showed that attributes 11, 12, 17 and 20 (Fig 3) and for Malays attributes 2 and 4 were in the fourth quadrant (Fig 4).

DISCUSSION

IPA has been applied to elucidate critical performance factors in customer satisfaction for products and services in a variety of disciplines (Hawes and Rao, 1985; Yavas and Shemwell, 1997; Zhang and Chow, 2004). In dental healthcare systems, by meeting potential demands of consumers (patients), the dental staff can attract and then retain a patient population to a greater extent. Therefore, it is important to improve items which result in a low level of overall satisfaction, although it is unrealistic to improve all of these items simultaneously with limited resources.

According to our results, the three major ethnic groups in Malaysia, i.e. Chinese, Indians and Malays, rated dental satisfaction differently on the questionnaire which measured the level of importance and performance of quality attributes (Dewi et al, 2011). This is similar to some previous reports which found a relationship between patient satisfaction and ethnicity (Cleary and McNeil, 1988; Handelman et al, 1990; Saha and Hickam, 2003), where Black patients tended to be the least satisfied, Hispanic patients were only moderately satisfied when compared to non-Hispanic patients and Asian-Americans reported less satisfaction with healthcare than other racial or ethnic groups.

Until now, there has been no published report in the dental literature which has determined the differences among the three ethnic groups of Malaysia. Using Importance-Performance Analysis, the

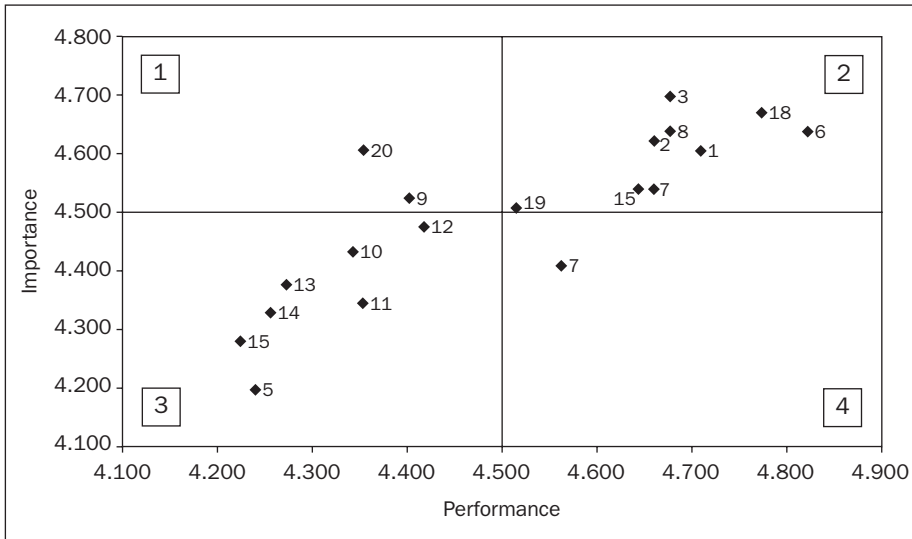


Fig 2 Importance-performance analysis grid for the attributes among the Chinese ethnic group.

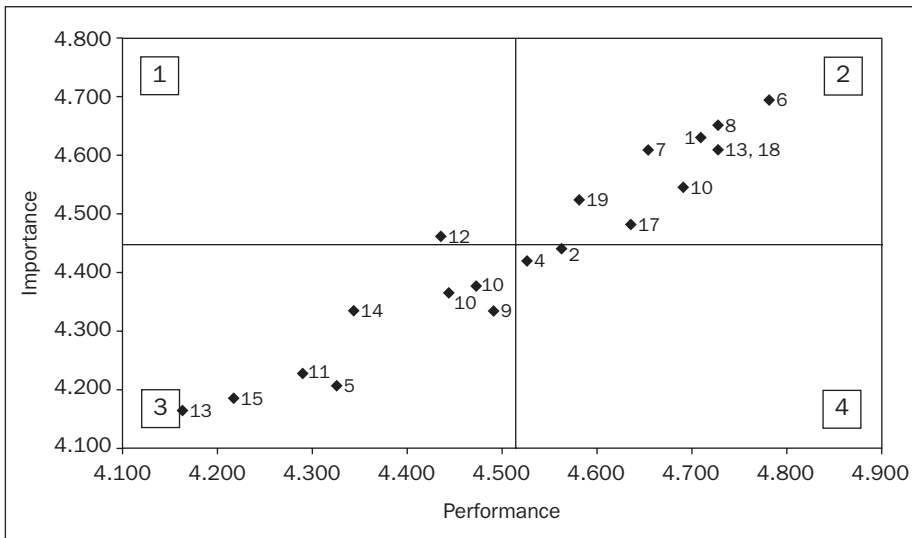


Fig 3 Importance-performance analysis grid for the attributes among the Indian ethnic group.

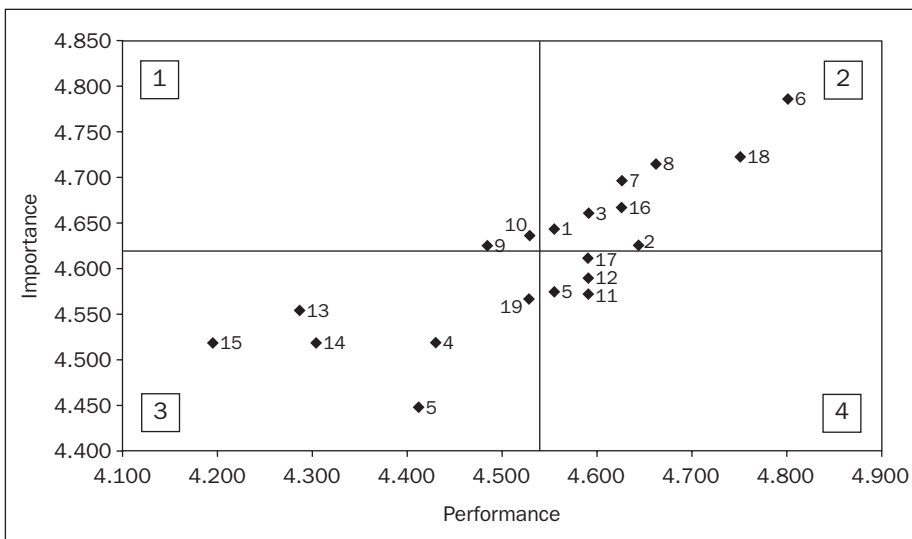
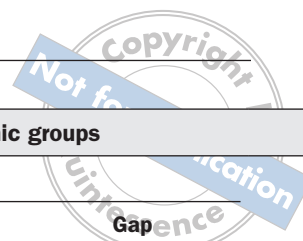
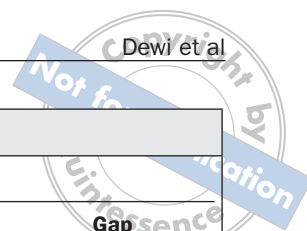


Fig 4 Importance-performance analysis grid for the attributes among the Malay ethnic group.

**Table 3 Assessment of importance, performance and gap for the 20 attributes among the 3 ethnic groups**

| QUESTIONS | Chinese | | | | | |
|--|------------|---------|-------------|--------|-------|--------|
| | Importance | | Performance | | Gap | |
| | Mean | SD | Mean | SD | Mean | SD |
| Technical Competence | | | | | | |
| Dental student was very careful to check everything when he/she examined you | 4.607 | 0.556 | 4.710 | 0.555 | 0.103 | 0.001 |
| Dental student instructed you clearly on how to maintain oral hygiene | 4.623 | 0.582 | 4.661 | 0.510 | 0.038 | 0.072 |
| Dental student performed dental treatment properly (injection, drilling, filling etc.) | 4.700 | 0.561 | 4.677 | 0.536 | 0.023 | 0.025 |
| Dental assistant's ability was adequate | 4.410 | 0.824 | 4.565 | 0.668 | 0.155 | 0.156 |
| Receptionist's service was fast enough during registration | 4.197 | 0.891 | 4.242 | 0.900 | 0.045 | 0.009 |
| Interpersonal | | | | | | |
| Dental student always treats the patients with respect | 4.639 | 0.606 | 4.823 | 0.385 | 0.183 | 0.221 |
| Dental student explains the treatment procedure clearly before starting treatment | 4.541 | 0.621 | 4.661 | 0.510 | 0.120 | 0.111 |
| Dental assistant is well-mannered during assisting | 4.639 | 0.578 | 4.677 | 0.505 | 0.038 | 0.073 |
| Receptionist is courteous and friendly during registration | 4.525 | 0.622 | 4.403 | 0.819 | 0.121 | 0.197 |
| Receptionist's response to patient on the phone is polite | 4.433 | 0.890 | 4.344 | 0.947 | 0.089 | 0.057 |
| Convenience | | | | | | |
| AIMST Dental Centre is conveniently located | 4.344 | 0.750 | 4.355 | 0.832 | 0.011 | 0.081 |
| I never wait too long before the treatment begins | 4.475 | 0.622 | 4.419 | 0.780 | 0.056 | 0.158 |
| It's easy to get an appointment at the AIMST Dental Centre | 4.377 | 0.687 | 4.274 | 0.853 | 0.103 | 0.165 |
| The office hours of the AIMST Dental Centre are suitable to my schedule | 4.328 | 0.724 | 4.258 | 0.904 | 0.070 | 0.180 |
| The treatment did not go on for a long time | 4.279 | 0.710 | 4.226 | 0.798 | 0.053 | 0.088 |
| Facility | | | | | | |
| The receptionist's area is neat and clean | 4.607 | 0.556 | 4.710 | 0.524 | 0.103 | 0.032 |
| The air conditioning in the clinic is comfortable | 4.541 | 0.621 | 4.645 | 0.546 | 0.104 | 0.075 |
| The dental equipment is clean and presentable | 4.672 | 0.625 | 4.774 | 0.493 | 0.102 | 0.132 |
| The toilet is clean | 4.508 | 0.698 | 4.516 | 0.695 | 0.008 | 0.003 |
| The parking area is convenient, large and safe | 4.607 | 0.585 | 4.355 | 0.943 | 0.252 | 0.357 |
| Mean | 4.503 | 0.14228 | 4.515 | 0.1969 | 0.089 | 0.0605 |



| Indian | | | | | | Malay | | | | | |
|------------|--------|-------------|--------|-------|--------|------------|--------|-------------|---------|-------|--------|
| Importance | | Performance | | Gap | | Importance | | Performance | | Gap | |
| Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD |
| 4.643 | 0.554 | 4.554 | 0.570 | 0.089 | 0.016 | 4.655 | 0.584 | 4.709 | 0.458 | 0.055 | 0.126 |
| 4.625 | 0.489 | 4.643 | 0.483 | 0.018 | 0.005 | 4.491 | 0.635 | 4.564 | 0.601 | 0.073 | 0.033 |
| 4.661 | 0.478 | 4.589 | 0.532 | 0.071 | 0.054 | 4.636 | 0.557 | 4.727 | 0.449 | 0.091 | 0.107 |
| 4.518 | 0.632 | 4.429 | 0.710 | 0.089 | 0.078 | 4.473 | 0.663 | 4.527 | 0.663 | 0.055 | 0.000 |
| 4.446 | 0.685 | 4.411 | 0.733 | 0.036 | 0.048 | 4.291 | 0.786 | 4.327 | 0.862 | 0.036 | 0.076 |
| 4.786 | 0.414 | 4.800 | 0.404 | 0.014 | 0.010 | 4.709 | 0.533 | 4.782 | 0.417 | 0.073 | 0.116 |
| 4.696 | 0.464 | 4.625 | 0.620 | 0.071 | 0.156 | 4.636 | 0.620 | 4.655 | 0.584 | 0.018 | 0.035 |
| 4.714 | 0.494 | 4.661 | 0.549 | 0.054 | 0.054 | 4.673 | 0.579 | 4.727 | 0.489 | 0.055 | 0.090 |
| 4.625 | 0.524 | 4.482 | 0.632 | 0.143 | 0.108 | 4.400 | 0.760 | 4.491 | 0.663 | 0.091 | 0.097 |
| 4.636 | 0.485 | 4.527 | 0.573 | 0.109 | 0.087 | 4.426 | 0.792 | 4.444 | 0.664 | 0.019 | 0.128 |
| 4.571 | 0.599 | 4.589 | 0.565 | 0.018 | 0.034 | 4.309 | 0.814 | 4.291 | 0.854 | 0.018 | 0.040 |
| 4.589 | 0.626 | 4.589 | 0.565 | 0.000 | 0.061 | 4.509 | 0.767 | 4.436 | 0.811 | 0.073 | 0.044 |
| 4.554 | 0.601 | 4.286 | 0.825 | 0.268 | 0.224 | 4.255 | 0.821 | 4.164 | 0.938 | 0.091 | 0.117 |
| 4.518 | 0.687 | 4.304 | 0.761 | 0.214 | 0.074 | 4.400 | 0.760 | 4.345 | 0.927 | 0.055 | 0.167 |
| 4.518 | 0.572 | 4.196 | 0.699 | 0.321 | 0.127 | 4.273 | 0.912 | 4.218 | 0.832 | 0.055 | 0.080 |
| 4.667 | 0.514 | 4.625 | 0.590 | 0.042 | 0.076 | 4.582 | 0.599 | 4.691 | 0.505 | 0.109 | 0.095 |
| 4.611 | 0.564 | 4.589 | 0.596 | 0.022 | 0.033 | 4.527 | 0.634 | 4.636 | 0.589 | 0.109 | 0.045 |
| 4.722 | 0.492 | 4.750 | 0.437 | 0.028 | 0.055 | 4.636 | 0.589 | 4.727 | 0.525 | 0.091 | 0.063 |
| 4.566 | 0.572 | 4.527 | 0.604 | 0.039 | 0.032 | 4.564 | 0.631 | 4.582 | 0.567 | 0.018 | 0.064 |
| 4.574 | 0.602 | 4.554 | 0.711 | 0.021 | 0.110 | 4.436 | 0.714 | 4.473 | 0.716 | 0.036 | 0.002 |
| 4.612 | 0.0828 | 4.536 | 0.1508 | 0.083 | 0.0889 | 4.494 | 0.1426 | 4.526 | 0.18540 | 0.061 | 0.0302 |

strengths and weaknesses of dental service offered to the patients from each ethnic group can be evaluated. The four-quadrant grid helps to identify the areas for improvement and plan actions for minimising the gap between importance and performance (Schouton et al, 2003). Plotting the IPA grid suggests the quality attributes that require urgent corrective action and top priority, as suggested by the patients.

The attributes in quadrant 1 are vital and need immediate attention to achieve patient satisfaction. According to the Chinese ethnic group, it shows the provider needs to improve the interpersonal factor in which the receptionist was not friendly and courteous; furthermore, they found that the parking area (facilities list) was too far from the clinic. This is in agreement with another study that mentioned dissatisfaction with the members of the administrative staff who had a non-professional attitude or rendered unprofessional service (Hanoum and Moses, 2009). The same experience was mentioned by Indian patients, who reported a non-friendly attitude of the receptionists in addition to their non-courteous response over the phone. In contrast, the Malay ethnic group stressed the convenience factor, specifically the long waiting period in the reception area before treatment, which agrees with previous studies (Mascarenhas, 2001; Miranda et al, 2010). This could be dealt with by improving the time management while treating patients or by providing on-time appointments, so that the treatment can begin as soon as the patient enters the waiting area. This suggests there is little ethnic differences in quadrant 1 attributes.

The questionnaire identifies gaps between importance and performance: a large gap indicates patient dissatisfaction and a small gap shows patients' satisfaction with particular items, based on patient experience (Holt and McHugh, 1997). The gap results show that a facility-related attribute evoked the most dissatisfaction for Chinese patients: the parking area was too far from the dental center. In contrast, the Malay ethnic group was most satisfied (smallest gap) with a different facility-related attribute: the toilets were clean. This differed from the Indian ethnic group, which was less satisfied with lengthy treatment and patients being required to return several times, but were more satisfied with the concerned, respectful way that students treated patients. On the other hand, the Malay group was dissatisfied with the cleanliness of the receptionist area and the comfort level of the

air conditioning (facilities list). However, as opposed to the present study, Janda et al (1996) suggest that dental care providers not emphasise convenience-oriented attributes such as location and parking facilities, but instead focus on core-service characteristics such as quality, professional competence, personality and attitude of the dental team.

CONCLUSION

The current study identifies the priority ranking given by the three main ethnic groups in Malaysia to dental services. The Chinese were more concerned with receptionists' attitude and other facility-related comforts; the Indians with the receptionists' attitude and treatment time required; the Malays emphasised the dental-clinic environment and cleanliness. It is evident in this study that irrespective of the ethnicity, the most dissatisfying issues were the hospitality of the dental service team and ease of access to treatment.

ACKNOWLEDGEMENTS

Our sincere thanks go to Professor Dr. Wihaskoro Sosroseno, Senior Academic Staff, for all his encouragement, guidance and timely advice. We are grateful to the whole senior dental assistant staff at AIMST University for their hands-on support in conducting this survey.

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