Patient Satisfaction Survey at the Dental Human Dock Clinic of Nihon University School of Dentistry at Matsudo Hospital

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Abstract
In 2011, physical and operational changes were made to improve our institution’s dental human dock clinic. The physical change was consisted of aesthetic improvements to the comprehensive checkups being performed in individual rooms. The operational changes were improved diagnostic accuracy and increased the number of tests available to patients as part of the oral dock checkup, namely, adopting a test of caries risk (testing for bacteria that cause tooth decay), an IgG antibody titer test for periodontal pathogens using blood collected from the fingertip, a bite test and a halitosis test, as well as adding more staff members to the examination team. After these improvements were implemented, we conducted a survey to assess patient satisfaction at the clinic. The survey asked patients to provide their overall impression of the clinic and to rate facilities and equipment, dental care providers, clinical tests, evaluation reports and other aspects. A 10-point scale was used to rate overall impression and a 5-point scale was used to rate all other items. Survey forms were distributed to 74 patients who received the checkup and consented to participate, of which 46 responded (response rate: 62.2%). Patients were generally very satisfied with dental care providers and clinical tests as reflected by an average overall impression rating of 7.9. However, the average rating for facilities and equipment was low at 3.76. The other aspects category received the lowest rating, with cost being rated at 2.43. We plan to improve the clinic’s operations by focusing on low scoring aspects of these findings.

Introduction
Japan’s population is aging and its birthrate is declining faster than in any other country in the world; it is estimated that more than 30% of the population will be aged 65 years or older in 2026(1). As the population ages, national health care expenditures are steadily increasing(2). In light of these social issues, and together with efforts to improve patients’ quality of life, the focus of health care has been shifting from early detection and treatment to maintenance and improvement of health.

Keywords:
Dental human dock clinic, patient satisfaction survey, oral human dock

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subsequent outreach activities, an increasing number of clinics and hospitals have begun to perform oral human dock checkups. However, most people have a strong impression that dental examinations are performed to gather diagnostic information for treatment and are unaware of the system of performing oral human dock checkups for health maintenance and enhancement. Therefore, very few people across Japan have these checkups.

The Dental Human Dock Clinic (for oral human dock examinations) at Nihon University School of Dentistry at Matsudo Hospital was established in 2006, but as was the case at dental clinics across the country, there were few oral dock patients in the first 2 years. In 2011, physical and operational changes were made to improve the clinic in order to attract more patients and bolster health maintenance and enhancement efforts. The physical change involved using individual examination rooms to perform checkups. The operational changes were increased the number of tests available to patients as part of the oral dock checkup, namely, adopting a test of caries risk (testing for bacteria that cause tooth decay; BML, Tokyo, Japan), an IgG antibody titer test for periodontal pathogens using blood collected from the fingertip (hereinafter, "IgG antibody titer test"; Leisure Inc., Tokyo, Japan), a bite test using the Occluser (FPD-703; GC, Tokyo, Japan) with Dental Prescale (GC, Tokyo, Japan) and a halitosis test using a simple gas chromatograph (Oral Chroma; Abimedical Corporation, Hyogo, Japan). Moreover, additional staff were assigned to the examination team.

The purpose of this study was to ascertain and analyze patients’ impressions of the dental human dock clinic after these improvements were made and to apply the findings to the clinic’s subsequent operations.

**Materials and Methods**

The following 9 basic tests are performed at the dental human dock clinic: blood and urine test, panoramic X-ray, dental caries test, test of caries risk, test for periodontal disease, IgG antibody titer test, bite test, halitosis test and intraoral photography.

**Survey**

1) **Subjects**

A total of 74 patients who visited the clinic between April 2011 and March 2014 were included in the study.

2) **Survey methods**

A survey administrator contacted 74 patients who had previously visited the clinic and requested their participation in the survey. Survey forms were mailed to those who consented to participate. Surveys were filled out by hand and anonymity was protected.

3) **Survey items**

The survey form comprised the following items: questions on patient attributes, 4 items concerning patients’ overall impression of the clinic, 3 items on facilities and equipment, 6 items on dental care providers, 9 items on clinical tests, 10 items on evaluation reports and 3 "other" items. A 10-point scale was used to rate overall impression and a 5-point scale was used to rate all other items. Respondents indicated their rating of items by circling a number (Fig. 1).
This study was conducted with the approval of the Ethics Committee of Nihon University School of Dentistry at Matsudo (Approval number EC 13-022).

Analysis
Basic statistics were analyzed as follows.
1) Analysis of survey response rate and basic attributes of respondents
2) The mean and standard deviation (SD) of patients’ overall impression of the clinic on a 10-point scale and of their ratings of facilities and equipment, dental care providers, clinical tests, evaluation reports and other aspects of the clinic, each on a 5-point scale, were calculated and subsequently analyzed.

Results
Basic statistics
Survey responses
All 74 patients (19 males, 55 females) who visited the dental human dock clinic consented to participate in the survey. The 46 patients who returned the questionnaire were included in the study (response rate: 62.2%). It should be noted that the 74 patients were asked about their employment status.

Respondent attributes
Eighty-seven percent of respondents were female (6 males, 40 females) (Fig. 2). Mean age (± standard deviation) was 62.1 ± 9.9 years and most subjects fell within the age range of 61 to 70 years. There were no respondents aged 13-29 years or aged 80 years and over (Fig. 3). Mean travel time to the hospital was 46.3 ± 22.6 min and most travel times fell within the range of 51 to 60 min (Fig. 4). Most patients lived in Chiba Prefecture (63%), followed by Saitama Prefecture (15%), the Tokyo Metropolitan Area (13%) and Ibaraki Prefecture (9%) (Fig. 5).
Overall impression (10-point scale) (Table)
Patients rated the overall impression items as follows: “desire to visit the clinic again,” 8.52 ± 2.10; “willingness to recommend the clinic to another person,” 7.22 ± 2.30; “level of trust in the clinic,” 8.02 ± 2.06 and “overall impression,” 7.83 ± 2.11. The overall average rating for the 4 items regarding overall impression was 7.90 ± 2.18, with all ratings indicating a good impression of the dental human dock clinic.

Ratings of facilities and equipment (5-point scale) (Table)
The lowest rating for facilities and equipment (3.67 ± 0.90) was given to the examination rooms on the second floor, whereas the rating for privacy was high at 3.89 ± 0.92. The average rating for the 3 items regarding facilities and equipment was 3.76 ± 0.98 (Fig.6), making this the second lowest-rated category after “other aspects.”

Ratings of dental care providers (5-point scale) (Table)
With the exception of “checkup duration” (3.98 ± 0.53), all 5 items in this category received a high rating of at least 4, with “manner of speech and temperament” (4.33 ± 0.53) and “appearance” (4.26 ± 0.53) receiving particularly high ratings. The overall average rating for the 6 items regarding dental care providers was 4.17 ± 0.95 (Fig.6).

Ratings of clinical tests (5-point scale) (Table)
Blood and urine tests (3.80 ± 1.14) and the dental caries test (3.96 ± 0.95) received low ratings. However, the IgG antibody titer test (4.43 ± 0.86), the bite test (4.33 ± 0.92), the halitosis test (4.33 ± 0.90) and intraoral photography (4.28 ± 0.86) received high ratings. The overall average rating for the 9 items regarding tests was 4.20 ± 0.95 (Fig.6).
most patients live relatively close to the hospital. This, along with the characteristics and age distribution of patients, is very similar to the results of a hospital patient satisfaction survey conducted by Kimoto et al. (7).

At first glance, the average overall impression rating of 7.90 might seem high, but given that Iwasaki et al. indicated that actual patient satisfaction should be 80% or higher (8), it appears that this is in fact an average rating. One factor that contributed to this average rating was that the item “willingness to recommend the clinic to another person” was rated lower at 7.22. This may be because although patients were satisfied with most aspects of the clinic, they were not that satisfied with the “cost” item in the “other aspects” category and thus would hesitate to recommend the clinic.

We had anticipated that facilities and equipment would receive high ratings because the hospital was built in 2006 and examination rooms had recently been made private, but they actually received low ratings. Notably, one possible explanation for patients giving a low rating for the private examination rooms on the second floor could be that examinations are performed with the door open. It is hospital policy to keep doors open during examinations and treatment procedures. Although it would be better to close the doors to ensure patients’ privacy, this open-door policy is implemented for two major reasons. First, sexual harassment is a current social issue, particularly with female patients, and it is difficult to prove innocence or guilt if a problem should arise when health care providers are alone with patients. Second, if the patient were to experience difficulties, other members of the health care team would not quickly become aware of it if the door were closed. Although research has indicated that overall satisfaction is not heavily influenced by pleasantness rating (9), considering that the patient satisfaction level at our clinic has not yet surpassed 80% and given that we perform only checkups not treatments, we must explain this issue to hospital management and determine whether doors can be closed.

Patients’ impression of dental care providers was good overall. Ito used multiple regression analysis to identify aspects influencing patient satisfaction and desire to visit a dental office again and found that “the ability of dentists to treat patients well” and “the staff’s impression of the patient” were highly influential (10). In the present survey, patients’ high rating of dental care providers was probably the biggest factor that improved their overall impression.

However, the duration of the checkup, which was the only item in the dental care provider category with a rating lower than 4.0, should be reduced. When Kurihara et al. asked patients about optimal treatment times as part of a patient satisfaction survey, they found that most patients selected 30 min, followed by 1 h, with very few selecting 2 h or more (11). At our clinic, clinical tests are performed in three separate locations: blood and urine tests and the test of caries risk are performed in special examination rooms on the fourth floor, panoramic X-rays are taken on the first floor, and various other tests are performed on the second floor. This may increase the duration of the checkup or make patients feel like the checkup lasts longer than it actually does because they have to move after each clinical test. Considering that the basic checkup takes at least 2 h in total, we must decide whether it would be beneficial to perform all tests on the second floor.

The highest rated test was the IgG antibody titer test at 4.43, followed by the bite test, the halitosis test and intraoral photography. The IgG antibody titer test may have been rated so highly because the general population is becoming more aware that periodontal disease can cause heart disease, diabetes and low birth weight (12). In the bite test, which was the next highest rated test, a dental prescale that displays miniscule differences in occlusal force through color optical density is used in combination with an occlusal force gauge that displays occlusal contact. This device quantifies occlusal contact at each point of contact, calculates aspects such as pressure and surface area and can also display left-right balance and distribution. Thus, it can objectively analyze occlusal force, occlusal contact area and left-right balance (13), which may be why it received such a high rating. In the halitosis test, a simple halitosis quantifying device (Oral Chroma) is used. This device separately measures the volatile sulfur compounds (hydrogen sulfide, methyl mercaptan and dimethyl sulfide) (14). It has been shown that the ratio of methyl mercaptan to hydrogen sulfide is high in halitosis caused by periodontal disease, so this test is useful in differentiating physiological halitosis from halitosis caused by periodontal disease (15). Furthermore, as it is difficult to test for halitosis because the Oral Chroma device and other testing kits are expensive and because halitosis can be influenced not only by oral factors but also otorhinolaryngological and psychogenic factors (16), very few clinics perform this test. This may be why the halitosis test received such a high rating. Intraoral
photography is beneficial not only in the screening and diagnosis of oral disease, but also for helping patients objectively understand their oral condition and any issues they may have (17). We use photographs for this purpose at our clinic and patients showed greater interest in them than we had expected. Reasons for the poor ratings of the blood and urine tests and the dental caries test may include the fact that the blood and urine tests had some parameters not exclusively relevant to dentistry and that the dental caries test does not really differ from the test covered by national health insurance.

Among the evaluation reports we provide patients, the periodontal disease test report received a high rating, whereas the report on the IgG antibody titer test, which was the highest rated test, received a low rating. Periodontal disease test reports are created using specialized report software (PerioNavigation2; GC). This software can compile the periodontal disease test records of each person who visits the clinic into a database over time, and thus can be used as an aid in drafting documents for treatment planning and for explaining results to patients. These entries can also be printed out and given to patients as reports, and as shown in Figure 7, they are designed to be easy to read. For example, illustrations are used to explain periodontal pockets. In contrast, as shown in Figure 8, the report on the IgG antibody titer test provides a written explanation only and its explanation of the different types of bacteria that cause periodontal disease is probably too technical and difficult for many patients to understand, which is likely the reason for its low rating. This indicates that the report must be made easier to understand by, for example, including electron micrographs of the bacteria causing periodontal disease.

In terms of the last set of ratings analyzed, those for items in the "other aspects" category, cost was the lowest rated item and probably had a negative impact on the patients' overall impression. This is despite Yoshida et al. finding that cost was not an important reason for patients visiting a
hospital, in their survey of patients' behavior and impressions of hospitals (18). The overhead expenses are high for the tests performed during a checkup at our clinic, namely, a panoramic dental X-ray, blood test, test for caries risk, salivary buffering capacity test (Dentobuff, Oral Care, Tokyo, Japan) and an IgG antibody titer test. Thus, patients are charged a high rate. Nukina et al. showed that advanced medical care is unprofitable but highly useful (19) and therefore one way we could improve our clinic in the future could be to add more tests to the checkup. However, changing the tests performed may cause testing expenses to increase further, and we would like to improve the clinic by lowering expenses. Specifically, we must ascertain ways to reduce our expenses, which would reduce the cost to patients by a commensurate amount. Such changes could include reconsidering blood test parameters, analyzing the test of caries risk in-house instead of contracting an outside company and replacing our use of Dentobuff strips with the Oral Tester Mutans kit (Tokuyama Corporation, Tokyo, Japan), which comes with a buffering capacity test and is recommended by the Japan Academy of Oral Human Dock (20).

Taken together, the results indicate that although patient satisfaction with our dental human dock clinic was high overall after improvements were put in place, further improvements to certain aspects are still necessary.

**Conclusion**

From the results of a satisfaction survey assessing patients' impressions of our newly improved dental human dock clinic, such as "facilities and equipment", "clinical tests" and "evaluation reports", we draw the following conclusions.

1. The average patient satisfaction rating indicating "overall impression" of our dental human dock clinic was relatively high at 7.90 ± 2.18.
2. The 46 respondents were generally very satisfied with our "dental care providers" and "clinical tests".
3. The average rating of our "facilities and equipment" was low at 3.76 ± 0.98, and the "other aspects" category received the lowest rating, at a very poor 2.43 ± 0.98.

These results suggest that although patient satisfaction with our dental human dock clinic was high overall after improvements were put in place, further improvements to certain aspects are still necessary.

**References**