

Analysis of Market Demand for preventing malocclusion in preschool children: A case study of Myobrace appliances

Chih-Cheng Huang^a, Chiao-Ling Chung^b, Tzu-Ching Weng^c

^aPh.D. Program of Business, Feng Chia University, huangcc1975@gmail.com

^bSchool of nursing, Taipei Medical University, Taipei, Taiwan, b405106007@tmu.edu.tw

^cDepartment of Accounting, Feng Chia University, tcweng@fcu.edu.tw

Abstract

Orthodontics-related products and services have become important medical appliances in plastic surgery and dental clinics in the last years; traditional dental clinics mainly provide treatments for diseases or repairs. Different than the orthodontics appliances, which the main purpose is to improve the appearance of teeth, and in certain situations it can also improve chewing and speak functions, helping to protect teeth from damage or prevent dental caries. In order to achieve orthodontics skills, dentists will use a series of medical dental equipment, such as headgear, facial arch, and braces. Because orthodontics appliances are different from general functional dental treatments, especially for preschool children and adolescents, the expectations and satisfaction of the parents themselves are more than the satisfaction of the patient's themselves. Early orthodontics is a neglected project, the main reason is that the national policy focuses on functional treatment (such as dentures for the elderly) or dental caries treatment, and orthodontics appliances are ignored in many national health questionnaires. The prevention of dental diseases are not paid attention by dentists because most of the dentists are focused on treating the patient's appearance or defects caused by malocclusion rather than preventing dental malocclusion. By taking effective measures, preschool children can be prevented of malocclusion and bad oral habits. Many reports indicated that the use of orthodontic braces are simple and effective to prevent malocclusion, but it needs to be implemented and adjusted wisely, and prevent young children from malocclusion through health education, consultation and parents education. The purpose of this study is to evaluate parent's awareness of orthodontic methods, and analyze the market acceptance of Myobrace appliances and the key factors of consumer's choice through questionnaire analysis. The subjects of the study were parents of young children under 6 years old who had used Myobrace appliances for more than six months at a dental clinic in Taichung City, Taiwan. A total of 60 questionnaires were collected in this study, the average age of the respondents were 35.55 years old, and 80% of them were women; then the users (young children) had a similar male to female ratio, the vast majority of respondents agreed that incorrect dentition would affect facial appearance and oral hygiene; in terms of motivation, it indicated that most of them are from interviews made on the clinic (40%), and from an online survey (28.33%). In terms of cognition of orthodontic appliances, more than half of the interviewees did not know the indications for appliance, principles and differences of the appliance, most of them only knew how to use it. In terms of product satisfaction, only 28.33% were satisfied with the orthodontics appliance. The reason to use these products came from the recommendation of relatives, friends and social media, while the dissatisfied respondents mostly came from clinic interviews or health education centers. The ones who had no opinion about this were 55%. According to the survey results, most of the users of preventive orthodontic products came from interviews made on clinics and internet surveys, however, it is important to note that most parents do not understand the indications or principles of the products, so they may let users' parents with a high expectation for the benefits of the product, also, in the user

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satisfaction survey, it can be noted that non-clinic-related use motives are highly satisfied. The main reason is that preventive treatment is not significantly different from correction surgeries. Although most users' parents have a high awareness, the knowledge of the product is low, which is also the reason for the low satisfaction with the use of preventive aligners. Therefore, this study suggests that the marketing of preventive products should pay more attention to online information to strengthen consumer's willingness to use it actively. On the other hand, health education or clinic interviews should strengthen user's awareness of product indications, contraindications, principles, and benefits. Instead of letting users have high expectations for the appliances, resulting in low satisfaction with the preventive appliances and affecting their product promotion.

Keywords: orthodontics, dental, appliances, Myobrace.

1. Introduction

Orthodontics of Taipei Veterans General Hospital, the schoolchildren's malocclusion is positively correlated with their age, while the percentage of 16-year-old schoolchildren in Beitou District who have a normal bite is less than 20%, more than 80% of them have mild or severe malocclusion problems. Doctors believe that most of the causes of misaligned dentition are due to acquired bad habits. If proper preventive treatment can be taken, there is a chance to reduce the risk of developing malocclusion among schoolchildren, especially children who are changing teeth. Patients with severe malocclusion will have their oral health affected and quality of daily life reduced, the appearance defects caused by malocclusion may make children have a lack of self-confidence in their social group, or they may be neglected or laughed at by other people and make them have low self-esteem [1], [2]. Generally, patients with malocclusion can choose high-rigidity metal fixed appliances or functional appliances; functional preventive appliances have been developed for nearly a century and have become popular in the last years. Functional appliances are mostly used in children's overjet treatment and reported to reduce the need for a subsequent surgery [3].

Because children's dentition changes with the growth of bones and muscles, there are still many controversies about the actual efficacy of functional orthodontic appliances. The study by Ramirez-Yañez [4] found that orthodontic appliances can stimulate the growth of the mandible and increase the vertical size of the mandible; and expand the interpremolar distance of the upper and lower jaws and the distance between the molars (intermolar distance) [5]. However, there is still a lack of research comparing the clinical application of the functional orthodontic appliances with the control group. The main reason is that the group allocation of patients involves many complicated follow-up care problems, hence the study with dental appliance is mostly a case report.

Myobrace appliances was developed by the Myofunctional Research Co. founded by Farrell in 1989. It does not require tooth retention during the correction process and is mainly used to prevent or treat dental malformations during the dental transitional period. Myobrace appliances is made of materials with high elastic memory behavior, has a specific shape, is divided into different models and hardness, and is suitable for users of different ages. Myobrace appliances has a universal arch orbit, tongue position, lip stop and set the relative position of the upper and lower jaw. The appliance material with high elasticity utilizes a certain pressure on the teeth, so that the teeth are arranged along the predetermined purpose arch orbit, and the dentition can be arranged in an excellent manner. The tongue position guides the tongue toward normal position and prevents the force of the superior tongue from causing malocclusions. Some studies [6]-[8] indicated that the position of the tongue at rest is an important influence on the shape of the dental arch, and patients with malocclusion may be accompanied with bad habits such as upper lip biting, mandibular extension, finger sucking, tongue extension, etc. [9]. The upper and lower jaws of the Myobrace appliances are integrated; the oral screen and lip stop can prevent their bad habits, and help them to break the bad habits. Myobrace appliances are divided into two types: soft and hard, the initial process is wear the soft one and then changes to hard, instead of fixing the rigidity, it uses cushioned elastic force to act on the teeth to make them become aligned.

Although orthodontic surgery can treat patients in the later stage, the habit of preventive health care has been recently established in the society. Many parents use the Internet to learn preventive methods for their children, parents are considered to be a very important key part of promoting the oral health of preschool children and preventing malocclusion. Parents' oral health knowledge, attitudes and behaviors may affect the oral health of preschool children. Because the diagnosis and treatment behavior of malocclusion correction for preschool children is quite special, that is, the consumer decision maker is different from the user, the relevant consumption model does not meet the so-called user needs, but becomes a decision-maker oriented marketing model, in the last years, Taiwan's dental clinics have begun to focus on oral health education courses for

preschool children, combined with motivational lecture with parents, this allows parents to pay more attention to the prevention of children's oral problems, and allows parents to decide how to deal with this problems correctly.

The purpose of this study is to evaluate the parent's awareness of orthodontic appliances, and to explore the consumption motivation, product knowledge and satisfaction of Myobrace appliances through questionnaires method.

2. Materials And Methods

This study was designed using a questionnaire survey; the interviewees were parents of young children under 6 years old who had used Myobrace appliances for more than six months. The interview place was a dentist clinic in Taichung, Taiwan; the interviewees would first be asked basic information, including gender, age, education level, and monthly household income. Then, the interviewees should accept a questionnaire on dentition correction and prevention awareness, which contained 7 items (change the appearance of the face, improve the chewing function, reduce the incidence of dental caries, easy to maintain oral cleanliness, bad oral habits related to malocclusion, dentition correction takes a long time and it's expensive), and each cognitive item has two choices: agree or disagree. The questionnaire items for the motivation for choosing Myobrace appliances included recommendations from friends and relatives, online media suggestions, health clinic suggestions, medical staff interviews, brand appearance, clinical effectiveness (from professional publications), and user requirements (children themselves). Products knowledge had a total of 4 items (indications and contraindications, product principles, differences with other similar products, usage methods), and each option had two choices: understanding and not clear. Finally, there is a satisfaction survey (a scale score from 1 to 10). The satisfaction options were divided into very satisfied (greater than/equal to 8 points), satisfied (greater than/equal to 6 points, less than 8 points), and no opinion (greater than/Equal to 4 points, less than 6 points), unsatisfactory (less than 4 points).

3. Results

There were a total of 60 questionnaires in this study, and the results were showed as follows: (1) basic personal information, (2) awareness of dentition correction and prevention, (3) motivation to use Myobrace appliances, (4) Myobrace appliances knowledge, (5) Orthodontic satisfaction, etc., are described as follows:

(1) Basic personal information

Among the respondents, 12 were males (20%) and 48 were females (80%), with an average age of 35.55 years old. As for users, 31 were boys (51.7%) and 29 were girls (48.3%). Respondents have all education levels above university, 12 with master's degree and 1 with doctoral degree. In terms of monthly household income, 0 persons (0%) with monthly household income below 30,000 NTD, 6 persons (10.0%) from 30,001 to 50,000 NTD, 31 persons (51.67%) from 50,001 to 70,000 NTD, and 15 persons from 70,001 to 90,000 NTD (25%), 8 persons (13.33%) over 90,001 NTD.

(2) Awareness of dentition correction and prevention

Sixty persons (100%) agreed to change facial appearance, 55 persons (91.67%) agreed to improve chewing function, 56 persons (93.33%) agreed to reduce the incidence of dental caries, 55 persons (91.67%) agreed that it is easy to maintain oral cleanliness, 60 persons (100%) agree that bad oral habits will cause a malocclusions, 54 persons (90.0%) that need to be corrected for a long time, and 48 persons (80%) agree that the cost is expensive.

(3) Motivation to use Myobrace appliances

Recommended by relatives and friends were 5 persons (8.33%), online media recommends were 17 persons (28.33%), clinic health education were 8 persons (13.33%), medical staff interviews recommendation were 24 persons (40%), the brand appearance were 6 persons (10%), clinical effectiveness (from professional publication) were 0 person (0%), and user requirements (children themselves) were 0 person (0%).

(4) Myobrace appliances knowledge

There were 10 persons (16.67%) who knew the product indications and contraindications, 24 persons (40%) who knew the principle of the product, 13 persons (21.67%) who knew the difference with other similar products, and 60 (100%) persons who knew how to use the product.

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(5) Satisfaction

In terms of satisfaction, 6 persons (10%) were very satisfied, 11 persons (18.33%) were satisfied, 33 persons (55%) had no opinion, and 10 persons (16.67%) were dissatisfied. It is worth noting that the motivation of the respondents who were satisfied with the use of the Myobrace appliances comes most from the recommendation of relatives and friends or the Internet media. Among the dissatisfied respondents, 7 were interviewed by medical staff and 3 were health clinic recommendation.

4. Discussion

Many incorrect dentitions come from congenital heredity, but there are also incorrect dentitions that are acquired. If preventive work can be done, the incidence of the incorrect dentition can be greatly reduced. It is required to maintain the space for the growth of permanent teeth in the future, therefore, the deciduous teeth must be healthy and maintained, and by the time it should fall off, to keep the most available space for the permanent teeth. In many cases, it is very important to maintain the space of the teeth with orthodontic appliances, especially for children with small dental arches, even a normal natural tooth replacement has a high risk of causing space loss, and the dentist will provide preventive treatment with the space maintainer so it can slow down or solve the problem of crowded dentition.

Preventive appliances are quite common in dental clinics in the last years, many parents are more caring for their children and are willing to pay more for their children to prevent diseases under the trend of a declining birthrate, on the other hand, orthodontics appliances has also become the main service of many clinics project because young children's orthodontics appliances is a sales model that parents make decisions on their behalf. This study evaluated the parent's awareness of orthodontic appliances, and showed the results of using Myobrace appliances through questionnaires, evaluate the market consumption trend of preventive correctives based on the consumption motivation, product knowledge, and satisfaction of use. In terms of basic information on consumer group, the respondent's education level is above university level, and the median monthly household income is between 50,001 NTD and 70,000 NTD. There were no significant difference between the genders of young children in the use of appliances (boys:girls=31:29). Although the proportion of boys and girls receiving appliances is different from adults receiving orthodontic correction, which is mainly female [10], most of the decision makers interviewed were women, and it should be mainly because women themselves project their appearance and habits on their children, on the other hand, this group of consumer decision-makers have a high degree of appliances and preventive knowledge. Although decision-making parents agree with the concept of malocclusion prevention and the use of orthodontics appliances, they do not have a high understanding of the product principle, whether it is applicable to children's conditions, and clinical benefits, hence it caused the lower customer satisfaction.

Most respondents were more satisfied with product information from their relatives and friends or online information, compared to those who are not satisfied with recommenders from clinics, because the effect of preventive correction is not as fast as medication or surgical treatment, they do not feel the immediate difference, letting consumer decision-makers understand product knowledge is a good method to improve consumers satisfaction.

Through this questionnaire, it can be understood that most of the decision-makers interviewed were women and have a university education level or above, the motivation for use functional appliances comes from the non-clinic side and usually have higher satisfaction, this may also reflect that those with more active consumption motives have a higher degree of satisfaction with the product and a high cognition. On the other hand, most of the respondents recommended by the clinic have a high level of knowledge about the way the product is used, while the knowledge about the products principles is relatively poor, therefore, for the promotion of preventive dental diseases, the online marketing strategy or other non-clinic methods should be used to attract female consumer's purchase intention. In addition, the introduction of product knowledge should also be paid attention in health education or clinic interviews, so that consumers can understand how to use the product. As the current questionnaire survey of this research is still ongoing, follow-up research will expand the sample size and compare the odds ratio of consumer motivation and product knowledge relative to satisfaction.

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