

## ASSESSMENT OF EFFECTIVENESS AND ACCEPTANCE OF POWER TOOTH BRUSH AND MANUAL TOOTH BRUSH

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### ABSTRACT

**Introduction.** Power toothbrush has greater effectiveness as compared to manual toothbrushing techniques and this fact has been well documented. But the acceptance of the same by dental professionals is still very low.

**Methods.** This study was conducted in general practice to evaluate the effectiveness of a power toothbrush in 1200 patients, based on the clinical opinions of dental professionals in regard to patient's changing oral health status. In addition, a survey assessed the attitudes of dental professionals and patients toward the power toothbrush.

**Results.** It was seen by the dental professionals that power toothbrush had a positive effect on the oral health of 70% of their patient. The noticeable benefits with respect to a number of clinical criteria included plaque removal, improved gingival condition and reduced bleeding from gums. Most patients in the study (85%) said that they would continue using the power toothbrush once the study was completed. After the study many more dentists considered the power toothbrush to be the most effective way of brushing, and almost 70 percent said that they would now recommend a power toothbrush to their patients.

**Conclusions.** Power toothbrush was way more better than the manual method of brushing. The use of power toothbrush improved the oral health of patients in this practice based study, and the number of dental professionals who would recommend a power toothbrush increased markedly during the study. This study also increases the awareness of the potential of power toothbrush to improve oral health and oral hygiene.

**Key Words:** Power Tooth Brush .Manual toothbrush. Oral hygiene .Oral health

### INTRODUCTION:

After teeth have been completely cleaned by the dental professional or by the individual, soft microbial dental plaque continually reforms on the tooth surfaces. With time, plaque is the primary agent in the development of caries, periodontal

disease, and calculus the three conditions for which individuals most often seek professional services. If plaque, particularly at interproximal and gingival areas, is completely removed with home-care procedures, these dental-disease conditions can be prevented. Unfortunately, the

majority of the population is unable, uninstructed, or unwilling or does not realize the need to spend the time to remove plaque from all tooth surfaces, and/or the product(s) used are not adequate to remove plaque at critical sites. Plaque deposits can be removed either mechanically or chemically.

The power toothbrush were introduced in 1960s. Since then the power toothbrushes have been significantly improved. Today's power toothbrushes are both highly effective and reliable. Their efficacy in comparison with that of the manual toothbrush has been evaluated in a large number of well-designed short- and long-term controlled clinical studies carried out by academic institutions and contract research companies specializing in dental research. All these studies consistently have shown the power toothbrush to be superior, with results demonstrating greater plaque removal and, as a consequence, more improvement in gingival condition than that achieved with a manual toothbrush alone.<sup>1-5</sup>

In addition to being highly effective, power toothbrushes have been shown to be well-received by patients and have the potential to improve compliance. Stålnacke and colleagues<sup>6</sup> showed improved compliance with a power toothbrush, as did Hellstadius and colleagues,<sup>7</sup> who demonstrated

improved maintenance of plaque control in a group of patients with periodontal disease who were noted for their poor compliance with manual toothbrushing technique. Thus, power toothbrushes can have two clinically important benefits over manual toothbrushes.

First, they are more effective at plaque removal, presumably because they confer on the patient a better brushing technique, and, second, they encourage better compliance with brushing. However, despite these clinically proven benefits, relatively few dental professionals recommend the use of a power toothbrush to their general patient population.<sup>1</sup>

The fact that dental professionals do not wholeheartedly embrace the power toothbrush suggests that either the clinical data now available are not reaching them, or they are not convinced by the results of controlled clinical studies, which may not reflect the clinical situation as it applies to general practices. Therefore, practice-based studies<sup>8,9</sup> are needed to establish that the findings from controlled clinical trials apply to general practice settings.

This study involving a large patient base was designed to evaluate the potential of the power toothbrush to improve oral hygiene and to investigate the attitudes of

dental professionals and their patients toward this power toothbrush.

## **MATERIALS AND METHODS**

### **Study population.**

Few dental practitioners decided to do this study in their private clinical practice, which involved distributing manual toothbrush and power toothbrushes to selected patients. The dental professionals instructed their patients in the use of the Manual toothbrush and power toothbrush; they then monitored the clinical status of patients for approximately eight months. A total of 4 dental professionals decided to participate and were included in the study, resulting in an overall very large study population of patients.

Patient inclusion criteria included having a consistent recall history; a need to improve manual brushing practices or poor oral hygiene despite the use of an alternative power brush; interest in using a power toothbrush; and sufficient motivation to comply with a continued preventive oral care regimen.

**Study design.** The dentist made a subjective clinical evaluation of the patient's oral health, before and after changing to the power toothbrush. Data were collected using a patient evaluation form that asked a number of questions

designed to establish if use of the manual and power toothbrush had resulted in any change in clinical status and whether the patient was satisfied with the toothbrush. Data were collected from dental professionals after approximately eight months. Because of the uncontrolled study design and subjective nature of the data, only descriptive statistical analyses were carried out.

## **RESULTS**

**Clinical evaluation.** Evaluation forms for 1200 patients were available for analysis 8 months after the start of the study. The table shows baseline demographic characteristics of the group of patients. The majority of patients had been using a manual toothbrush, approximately 50% brushed two times per day and nearly three-fourths had good to excellent oral health.

At the first recall appointment for patients after they began using the power toothbrush, that was approximately 6 months after they started using power toothbrush, change in oral health status was evaluated by the dental professional and classified on a five-point scale from considerably improved to considerably worse. Majority of patients improved considerably, while the oral health of few of patients was considered to have become worse or considerably worse.

CHARACTERISTIC	PERCENTAGE OF PATIENTS
<b>age Age (Years)</b>	
<input type="checkbox"/> <input type="checkbox"/> 18	13
18-35	17
36-49	28443438222228282828282
≥ 50	<b>44</b>
<b>Brushing Method</b>	
Manual Toothbrush	<b>9898</b>
Power toothbrush	2
<b>Brushing frequency( no. of times of brushing)</b>	
≥ Two	<b>447</b>
One	32
<input type="checkbox"/> <input type="checkbox"/> One	21
<b>Oral Health Status</b>	
Excellent	9
Very Good	26
Good	32
Fair	16
Poor	5.8
Not given	11.2

**PATIENT GROUP (N = 16,903).**

**Clinical characteristics.**

Dental professionals were asked to specify, from a list of clinical characteristics, the changes that had been observed in patients in whom oral health had improved. Better cleaning along the gingival margin was reported for 55 percent of patients, improved gingival condition for 42.9 percent, better cleaning of lingual anterior surfaces for 33 percent, better cleaning of posterior surfaces for 34.8 percent, less calculus for 30 percent and less staining for 13.6 percent of patients. Other,

unprompted, comments about the clinical condition of less than 1 percent of the patient population included better approximal cleaning, less tooth sensitivity and decreased pocket depths. When completing the evaluation forms, the dental professionals asked patients how satisfied they were with the power toothbrush and whether they intended to continue using the product . When asked if they would continue to use the power toothbrush, 92 percent of patients responded that they would, compared with 4 percent who responded that they would not. 3 percent were not sure and 1 percent gave no answer.

## DISCUSSION

In contrast to nearly every other study carried out with power toothbrushes, this investigation was practice-based and involved a large number of patients (N = 1200). Of these, 1176 used a manual toothbrush and 24 used an alternative power toothbrush. The study involved 4 dental professionals, who monitored the effect of the power toothbrush on their patient's oral hygiene. Because of the number of patients involved, a large amount of data was generated; however, these data were of a subjective nature because it was impossible to calibrate the examiners with respect to scoring specific plaque and gingival indexes. Despite this, we consider the results of the study to be of particular value because they reflect the normal method of oral hygiene appraisal used by dental professionals at recall appointments—namely, an overall subjective evaluation of clinical status. Such a study is in agreement with the views of Mjör and Wilson,<sup>8,9</sup> who commented that observations from the real-world environment of dental practice are important in interpreting research data.

Results from this practice based study showed that 70 percent of patients benefited from switching to the power toothbrush, with dental professionals judging their oral health status to have improved somewhat or considerably compared with their baseline

status. This was true despite the fact that approximately three-fourths of the patients had been judged to have good, very good or excellent standards of oral hygiene at the beginning of the study.

The patients themselves endorsed this view, with 80 percent reporting their oral health to be somewhat better or much better than it had been when they were using only a manual toothbrush.

Findings from this practice-based study, appear to confirm the results from controlled clinical studies, which have shown that power toothbrushes,<sup>1,2,4,5</sup> including the one evaluated in our study<sup>3,11</sup> are more effective than manual toothbrushes.

Our results show that when dental professionals have direct experience with a power toothbrush, their perception of its value to patients changes. By the end of the study, those favoring power toothbrushes had increased from 32 to 65 percent and those who were undecided had decreased from 47 to 21 percent. Although this study resulted in a change in practice with respect to recommending use of the power toothbrush, it remains to be seen whether the results will help to convince the general population of dental professionals of the benefits of power toothbrushing.

## CONCLUSION

The superior effectiveness of power toothbrushes that has been shown in controlled clinical studies may also be exhibited in a general practice setting. In this practice-based study, we found that direct experience with a power toothbrush convinced the majority of dental

professionals of its clinical benefits and resulted in an increased level of recommendation to their patients.

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