Could the Waterpik® Water Flosser be a Viable Alternative to String Flossing for Dental Hygiene Students to Offer Their Non-compliant String Floss Patients?

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Abstract

“Dental school educators are key gatekeepers of information and influence to their students. Their actions and opinions count, because students are sensitive to what teachers do and say.” (Frazier, 2007) Students amass this information verbatim. One example is the emphasis placed on string flossing as the primary source for plaque biofilm removal between the teeth. I believe this restricts the student’s mindset, limits their thought process, and is not conducive to reflective critical thinking or action. Teaching alternative methods, in addition to string floss to the students would cater to a patient’s individualized needs, preferences, and capabilities. My project introduced the use of the Aquarius Water Flosser as an alternative to string flossing. The purpose was to encourage students to be flexible to diverse philosophies and opinions and to develop reflective critical thinking when making decisions.

My research data gathering consisted of a student questionnaire, classroom discussion, observing the students interacting with their patients in a clinic setting and role-playing. In addition, students watched a video presentation introducing the benefits and use of the Aquarius Water Flosser for plaque biofilm removal between the teeth.

At the end of my research, I found students asking open-ended questions and involving patients in their decision-making process; not just taking information received verbatim. Students weighed the information from their educators and began drawing their own conclusions regarding how they would relay this learned information to their
patients. Students assessed their patients and then offered choices depending on individualized needs, desires, and capabilities.

**Introduction**

The notion of string flossing is not new. For centuries, people have been using a variety of implements, such as grass stalks as toothpicks, and silk fibers to clean between their teeth. “Dr. Levi Spear Parmly, a New Orleans dentist, invented floss in 1815. He advised his patients to use a thin silk thread to clean between their teeth. Floss removes food trapped between the teeth and the film of bacteria that forms there before it has a chance to harden into plaque.” (Weber, 2014) Tooth brushing alone cannot clean effectively between teeth. If this area remains untreated, it could lead to gum disease.

While employed as a clinical hygienist in private practice, I continually stressed the need to use string floss daily to all my patients at each of their dental appointments. This was the method of interproximal teeth cleaning introduced to me in dental hygiene school. I took verbatim, what was enforced, and eagerly passed this information onto all my dental patients. I then followed *the repetition principle* that states, “If something is enforced often enough, it will eventually be persuaded, and through repetition it would create familiarity, and lead to understanding.” (Changing Minds.org) As Dr. Phil, a psychologist, life strategist, and popular American television host would say, “How’s that working for you?”

“The Cochrane Oral Health Group is an international, nonprofit organization that networks in a way that helps clinicians, researchers, consumers, and patients make
decisions about oral health care based on up-to-date, reliable, and accurate information.” (Riley, 2013) Data extracted from 12 randomized controlled trials reported in the Cochran Oral Health Group stated that there is evidence that flossing reduces gum disease. According to the American Dental Association, however, “only about 12 percent of Americans floss daily, 39% floss less than daily and 49% don’t floss at all.” (American Dental Association, 2008) I conducted my own survey for this project and found that most dental hygiene students believed that 95% of patients flossed daily, but when asked, only 5-25% actually did. Albert Einstein stated that “Insanity is doing the same thing over and over and expecting different results.” He indicated that one could not continue to solve a problem if a mindset or process was not altered to reach a different conclusion. I agree with this statement.

It is a challenge to get patients to add flossing to their daily regime. That is why my project is relevant and timely. The Aquarius Water Flosser is one alternative method to string flossing that is easy, effective, and takes one minute to do. I introduced this water flosser to the dental hygiene students participating in my project.

There have been numerous studies conducted by universities and clinical research facilities independent of any Waterpik® studies comparing string flossing to the Waterpik® Water Flosser. “In 2005, a report from the American Academy of Periodontology noted that the Waterpik® Water Flosser continues to play a role in the treatment of gingivitis and maintenance of periodontal pockets.” (Greenstein, G.2005) In 2006, the “Canadian Dental Hygienists’ Association recommended the home irrigator as one viable option to finger flossing.” (Asadoorian, J. 2006) “A study conducted at the BioSci Research Canada, Ltd. in Mississauga, Ontario, Canada, showed that the
Waterpik® Water Flosser was significantly more effective than string floss for removing plaque.” (Goyal, CR, et.al.2013) These are just a few of the many clinical research articles available to indicate the benefits of the Waterpik® Water Flosser as a viable alternative to string flossing.

When I realized that following the repetition principle was not working, I decided to change my thought process. I read clinical research studies and peer reviews to discover alternative flossing methods that might ensure greater patient compliance. I began asking my patients open-ended questions to find out what initiative I could take and resources I could offer to help them reach their oral health wants, desires, and needs. The result of involving my patients in their decision-making process for improved oral care, rather than me telling them what I thought they should do, enhanced our professional relationship and created greater patient compliance. This research project is the result of my reflective experience working as a clinical Registered Dental Hygienist in private practice.

My project aim was to encourage students to be open-minded to diverse philosophies and opinions, and to think outside the positivist epistemology of practice, or in other words, to think beyond authoritative knowledge. Offering alternative options according to the capabilities and needs of a dental patient will create trust and goodwill. Once trust is established, the patient will feel more relaxed and receptive to what a hygienist has to say. This will also result in a more cohesive long-term professional relationship. Since the water flosser is an easy, effective alternative to string floss, and might ensure greater compliance, I chose to conduct my research paper using this device.
Reflective Thinking

As I reflect back over my 30 year dental hygiene career, I realized nothing much had changed regarding the method of plaque biofilm removal from between the teeth I offered my patients. I was still following to the letter, the string flossing technique I learned in dental hygiene school. I limited my knowledge and aptitude being satisfied with status quo. This self-imposed lack of growth and career development led me to an unfulfilled dental hygiene career. Once I started attending nationwide conferences, workshops, seminars, and began networking with other hygienists throughout the United States, my attitude changed. I realized there were other avenues and opportunities for me to expand my horizons and go beyond the clinical office setting to find career fulfillment. I became a product educator, key opinion leader, public speaker, and mentor to dental hygiene students. I even wrote and self-published a book, *Exploring Dental Hygiene, Finding the Hidden Rewards*. It was my aim to motivate and encourage seasoned dental hygienists and dental hygiene students towards a more empowering, rewarding dental hygiene career. My mission was to promote career enrichment through self-discovery, life-long learning, and not to settle for status quo as I once did.

My current role as an Independent Product Educator on behalf of Waterpik® provides me the opportunity to go to dental offices and dental hygiene colleges and conduct PowerPoint Presentations regarding the benefits and use of the Waterpik® Aquarius Water Flosser. Water flossing is a practical alternative that is effective and easy to use for non-compliant string flossing patients. As a product educator and mentor to students, it is imperative for me to encourage dental personnel and students to step
outside their comfort zone and be open-minded to alternative flossing devices that
dental patients could use to remove plaque biofilm from between their teeth.

Having approximately 45 minutes to conduct my presentation in a dental office means
time is of the essence. I show a brief educational video, discuss key points from the
video, demonstrate the various water flosser models available, answer questions, and
promote sales. My goal is to have the dental team want to promote the Aquarius Water
Flosser as a viable alternative to their non-compliant string floss patients. If successful,
after my presentation I generate sales. I enjoy offering educational, instructional
strategies to dental teams to promote oral health. If they can create a plan of action to
motivate change on behalf of their patients, then I feel I have contributed to the well-
being of the dental hygiene profession.

As an independent contractor, on behalf of Waterpik®, I must conduct my
presentations precisely as instructed in my contract. This structured approach is not
conducive to transforming my experience into new learning or practice as a reflective
practitioner. It reminds me of the days when I attended dental hygiene school and took
what was taught to me, literally, and passed this knowledge on to my dental patients. If
I want a fulfilled career as a product educator, I need to make choices that allow me to
grow and develop through reflective thinking and learning. Mentoring to dental hygiene
students grants me this opportunity because I do not have to follow any specific
syllabus.

I was given authorization from the Dean at three local dental hygiene programs to my
conduct research project. With direct students contact, unlimited Waterpik® resources
and classroom time, I found this to be advantageous toward my vision for empowerment

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and career fulfillment as a product educator. Therefore, I opted for a reflective teaching and learning approach when I went into the dental hygiene schools for my research paper.

**Methodology**

**Plan/Process/Execution**

As a student of traditional teaching where a teacher lectures and students memorize information, followed by examination, I did not grasp the concept of critical thinking. This custom-tailored curriculum did not lend itself to application and understanding of facts through individualized discovery. I simply learned to pass a test to graduate to the next grade level. It was imperative to me, therefore, that during my project, I initiated critical thinking and reflective/inquiry learning skills for students to develop and use throughout their life and career. I did this by offering students a more objective approach to learning using open-ended questions to encourage student participation in discussions and a hands-on activity to allow them to analyze, evaluate, and derive outcomes for themselves.

This project took place at three dental hygiene colleges with 98 students participating. Prior to conducting my research, I met with the Dean of each college and asked them to read and sign a permission letter and an ethics statement letter I composed. I gave a copy of the letters to each Dean for their files, and kept one for myself. My research began with a student questionnaire I created. (Table I) This questionnaire was a mandatory student requirement from the lead educator at each college. The purpose of the questionnaire was for me to acquire information from the students that would allow
me to comprehend the level of knowledge they had regarding string flossing versus water flossing to remove plaque biofilm from between their teeth.

**Table I  Student Questionnaire**

1) Had you ever heard of flossing prior to dental hygiene school? Yes  No  
   If so, by whom? _______________

2) Do you floss daily? Yes  No  
   If so why? _____  If not, why not? ______

3) In your estimation, what percentage of your patients do you think floss daily? ____%. Please explain your answer. ______

4) If there, was an alternative method to string flossing would you be interested in hearing about it? Yes  No

5) If there were an alternative to string floss that would promote compliance, would you be willing to discuss it with your patients? Yes  No

6) Have you been educated on the benefits of a water flosser in school?  
   Yes  No

7) Do you know how to use a water flosser device? Yes  No

**Answers to the questionnaire:**

1. Most students said they heard about flossing from their parents, dentist, or hygienist.

2. 25% of the students reported not flossing daily due to lack of time or laziness.

   73% of the students stated they flossed daily since attending hygiene school because they wanted healthy teeth and gums and to set a good example for their patients.
3. **Table II** is a pie chart illustrating the 98 students and the estimated percentages of their patients who floss daily.

4. 100% of the students answered yes to this question.

5. 100% of the students answered yes to this question.

6. Students stated they had no previous classroom education on the benefits of a water flossing device, but knew what a water flosser looked like.

7. Students stated they did not receive any hands-on demonstration regarding the use of a water flosser device.

Table II

<table>
<thead>
<tr>
<th>Percentage</th>
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<tbody>
<tr>
<td>5%</td>
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<tr>
<td>10%</td>
<td>10</td>
</tr>
<tr>
<td>20%</td>
<td>19</td>
</tr>
<tr>
<td>25%</td>
<td>30</td>
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Excuses students heard from their patients why they do not string floss:

100% too time consuming.

39% dexterity issues, too hard.
8% did not place any significant value for flossing.
5% did not like their fingers in their mouth.
5% it hurt their gums to floss.

Once I gathered and reviewed all the data, I scheduled my school visits. During the first of two classroom visits, I review the questionnaire data I with the students. Since the students stated on the questionnaire that they had no prior classroom education on a water flossing device, I asked if they would allow me to show them a brief educational video. The students agreed that watching a video would be a beneficial way to compare string flossing to water flossing.

The objectives of the educational video were to:

- Understand the benefits of the Aquarius Water Flosser
- Compare the use of the Aquarius Water Flosser to string floss
- Offer clinical research information
- Offer instructions on how to use the Aquarius Water Flosser

After viewing the video, I reviewed some of the key points from the slides. Upon my reflection-on-action, I realized this was not necessary and I could eliminate this element from future classroom activities. A study entitled “Mapping Brain Activation and Information during Category-Specific Visual Working Memory states that humans have a remarkable ability to store visual information at high detail over short periods of time.” (Linden, et al. 2011) Students were more eager to try the Aquarius Water Flosser for themselves than listen to a review of what they just watched on the video. “People learn best when they actively participate either through conversation or practical project.” (Dunning, 1986) Using three different tips, I selected three students to
demonstrate the use of the Aquarius Water Flosser to their classmates. I felt it was important that unbiased feedback from their peers be an essential aspect of their reflective/learning experience. Lively discussion ensued between the demonstrators of the water flosser and their classmates. Questions such as ease of use, weight of device once filled with water, and how their mouth felt afterwards were asked. One of the complaints recorded in the questionnaire about string flossing was that it was time consuming. Since water flossing only takes one minute to use, students were hopeful patients would be more compliant. They also recognized that using the water flosser would help those individuals who said they did not want their fingers in their mouth, had a problem with dexterity, and that string flossing hurt their gums. Seeing how easy it was to use, and hearing positive comments from their peers convinced students to attempt to include a discussion about the Aquarius Water Flosser as an alternative to string floss when reviewing home care instructions with their patients. They thought it would be a plus for patient compliance. “Patients should be made part of the reasoning process connected with their own treatment.” (Dunning, 1986)

At the end of my first visit, I left behind an Aquarius Water Flosser, for the students to use as a visual aid in the dental clinic. Recognizing the importance to try products one might recommend to patients for proper articulation purposes, use, and personal experience, I offered the students a discounted fee to encourage them to make a purchase. I was impressed with the many students who took advantage of my offer. In addition, I gave an Aquarius Water Flosser to the three students who conducted the demonstration. After one month of use, I emailed those three students to get additional feedback from them. The first student stated, “I like using the water flosser because it
massages my gums, goes interproximal, and is easy to go around the brackets of my orthodontic bands. I notice more food getting flushed out from between my teeth, than with string floss because I can see all the food in my sink.” Student number two gave her Aquarius Water Flosser to her 13 year-old son, who refused to floss, and on more occasions than he would like to admit, he conveniently forgets to brush. Since the Aquarius was in his bathroom, she did not use it herself. She did state that her son’s tissues looked healthier, less edematous, and his breath smelled better. The last student was grateful for the Aquarius because she has two three-unit bridges in her mouth and did not like to use a floss threader. She noticed her mouth felt cleaner and fresher because the water flosser was removing food particles and bacteria from under the bridges. She did not notice a bad odor in her mouth any longer.

During my second visit to the colleges, I observed the students interacting with their patients in the dental clinic. I wanted to investigate the application of new knowledge communicated to them during my initial visit. I noticed those students who purchased the Aquarius during my first visit found it easy to communicate their personal experience to patients. Other students took advantage of the clinic demo model I left for them to use as a visual aid. Creatively, as a discussion reminder, some students posted on the wall in their operatory a photo of various alternative methods of string flossing. Each student recognized the value of offering choices and getting their patient involved with the decision-making process; rather than dictating to their patients what they thought was best.

After clinic, students returned to the classroom so I could discuss my observations and conduct a student role-playing session. “Information, alone, rarely makes people
change their minds, but personal experience often does. Role-playing, like any good inquiry approach, transforms the content of education from information into experience.”

(Carlton, 2013) Role-playing inspires confidence and helps refine communication skills. These are key attributes that may help new graduates become more employable and set apart from other applicants during an interview.

**Project’s Impact on Oral Healthcare/Clinicians**

Focusing on prevention, rather than a cure to help patients avoid gum disease, is a primary goal of dental hygienists. One key to prevention is finding delivery systems and techniques that a patient will feel comfortable performing on a daily basis. It becomes a win-win situation for the dental hygienist and dental patient when they work together as a team to find solutions for improved home care. Since oral health is linked to general health and well-being, I feel actively involving a patient in their decision-making process by offering alternative methods to aid in home care compliance is essential. This project offered the Waterpik® Aquarius Water Flosser as one alternative method of plaque biofilm removal from between the teeth that a patient could purchase and use to improve their oral health. In addition, students recognized the need for patients to have a voice in what they wanted to do, rather than be told by the student what they thought would be best for them.

**Business Aspect**

Dentistry is a business, and the dental hygienist is its most valued asset. They educate, motivate, and inspire change for their patients. Offering options to assist
patients in making well-informed decisions, promotes trust and goodwill. Patients may be more willing to return for treatment, be more compliant to suggestions, and refer others to the dental practice. Promoting product purchase will help support productivity and profitability for a dental hygiene department in the dental practice.

Conclusion

To ensure a more rewarding, empowering career, students must learn to evaluate, analyze, and incorporate information received in the classroom to formulate their own decisions. Gone are the days for amassing information verbatim and living within a structured format. Reflecting upon learned knowledge, experiences, and life lessons will open a student’s mind to a more advanced way of learning and living.

*Could the Waterpik® Water Flosser be a Viable Alternative to String Flossing for Dental Hygiene Students to Offer Their Non-compliant String Floss Patients?* All students, as well as I, agreed that the answer is a resounding YES!

Referencing List


