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Empowering the World Through Dentistry

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Empowering the World Through Dentistry

A Capstone Experience/Thesis Project

Presented in Partial Fulfillment of the Requirements for the Degree Bachelor of Science with Honors College Graduate Distinction at Western Kentucky University

By

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Abstract

Dentistry is a very specific trade that one develops after years of education and training. With this skill comes a great amount of power and opportunity to serve, and with great skill comes great responsibility. Many dentists have decided to answer the call of third world countries that lack proper health care and specifically dental care. They do this in a variety of ways from sending supplies, supporting a local clinic financially, or traveling to the country for a short-term trip where they provide dental care to as many patients as they are physically able to for 7 to 10 days. In my capstone/thesis experience I propose that instead of practicing the "give a man a fish" philosophy, dentists practice the "teach men to fish" philosophy. This is called the empowerment theory, and it involves the dentist passing on his skills to leaders in a community to address the detrimental issue of improper dental care that is so common in third world countries. I show the theory to be effective through the description of my experiences in Belize, India, and finally Ghana where I participated in a research study with faculty from the University of Kentucky College of Dentistry. Through research of other methods and many hours of experience in other countries, I can prove that dentists following the empowerment theory can make a sustainable impact in the communities they help.

Keywords: Empowerment, Dental Care, and Dentistry

Dedicated to my Father, Charles W. Vittitow Jr.

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This project would not have been possible without the inspiration of my father, Charles Vittitow Jr. DMD, who has been an excellent role model to me in his passion to serve others through his profession of dentistry. I am grateful to him for allowing me to participate in his adventures overseas.

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Thank you to Dr. Craig T. Cobane, who rescued me when I was on the edge of giving up. You have made my Honors College experience a rich and meaningful memory of my college career and I know I will one day look back and be grateful for the special interest you took in me to inspire me toward finishing this project.

And finally thank you to my family, who always supports me in all my endeavors. I love all of you and hope we can continue to make an impact on the world while building each other up.

VITA

November 20, 1988…… Born – Louisville, KY

2007……Christian Academy of Louisville, KY

2009……. Mission Trip Hyderabad, India

2009…….. Mission Trip Ghana, Africa

2011…… Study Abroad Gales Point, Belize

FIELDS OF STUDY

Major Field: Biology

Minor Field: Chemistry

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INTRODUCTION

A little boy sits on the dock, grasping his stomach as if he is holding something inside of it. A man strides by with a string of freshly caught fish. He gazes at the famished boy and generously grants him one of his catch. The boy is satisfied for the night. The next day another man strolls by carrying a fishing pole and a tackle box. He notices the young child clutching his stomach and sees his need. The man takes a few minutes to teach the boy how to fish. He generously gives him one of his fishing poles and the boy is satisfied for a lifetime. This principle of "teaching someone to fish" is applicable in many arenas. Dentists are actually starting to adopt this same philosophy as the man who gave up his fishing pole. The more fortunate dentists are empowering the less fortunate people of third world countries with a skill that can change lives. Instead of caring for an acute issue, dentists are now providing education so people may practice dentistry themselves. This way people may have proper dental care for a lifetime.

The need for dental care in third world countries is tremendous and the epidemic of dental problems is increasing with time. According to Saparamadu, "In underdeveloped countries about 75 to 80 percent of the population live in rural areas where no dental care is offered" (Saparamadu 1986). With such a large number of people not receiving dental care, it seems as though these problems will remain unsolved for generations to come. As the countries

continue to grow, more people will be bred that do not understand how to practice and maintain good oral hygiene and don't possess the resources to educate others.

Significant health disparities exist in several countries that lack the resources (money, dental supplies, sanitary operating areas), especially in rural areas. Dental care systems or lack there of, have major impacts on the people, communities, and economics of a country. Lack of health care and specifically dental care show outcomes in socio-economic, cultural, human resource availability, political commitment, financial allocation, and information transfer. These restrictions can be seen at levels from community, service delivery, and policy levels (Evans 2004)

Sri Lanka can be considered a model for a third world country suffering from poor dental health. The population of Sri Lanka is fifteen million with a growth rate of 1*7 (meaning the population is increasing at a factor of seven) per decade. Of the population thirty-nine percent are less than fifteen years of age with over 80 percent living in rural villages (Ministry of Health 2009). In Sri Lanka dental care is offered through various hospital dental clinics throughout the island. There are about 580 dentists to serve the whole population, which means there is one dentist for approximately 26,000 people. Many unqualified practitioners have also set up dental workshops in rural villages. These practitioners extract teeth and have even applied some orthodontic appliances to their "patients" but are doing so with no formal training and are only causing more damage.

With so few qualified dentists and little resources, it seems near impossible to help a significant number of people. Many people in countries such as Sri Lanka have accepted that oral health is an issue that is too expensive to deal with. Even a toothbrush and toothpaste can cost more than a person's daily wage. And so, the only time people will seek dental care is when

the pain of infection prompts the need for extraction. An article published in *The Journal of Public Health Dentistry* states, "It is not unusual for people, on the rare occasion of seeing a dentist, to even request that their healthy teeth be pulled to avoid pain of future infections" (Kamliot & Leiner 1992). This is a serious problem because people are underscoring the importance of keeping their teeth and see teeth as more of a burden. It is as ignorant to replace all the windows in a house because one window has a problem. This is due largely to the fact that most countries lack the proper dental hygienic attention and most importantly, education. As you can see by the Human resource report, most third world countries simply don't have enough dental professionals to meet their needs and educate them on how to preserve their teeth.

Figure 1.1

Human Resources for Health -> Basic data (last updated 26 October 2004)			
Dentists, density per 100 000 population			
(Periodicity: Year, Applied Time Period: latest available data)			
Country	**Year**	**Dentists per 100,000**	**Source**
Norway	2004	125.22	WHO/EIP/HRH
Lebanon	2004	121.08	WHO/EIP/HRH
Israel	2004	119.66	WHO/EIP/HRH
Uruguay	2004	116.07	WHO/EIP/HRH
Greece	2004	113.67	WHO/EIP/HRH
Monaco	2004	107.08	WHO/EIP/HRH
Cyprus	2004	102.58	WHO/EIP/HRH
Iceland	2004	100.25	WHO/EIP/HRH
Brazil	2004	95.16	WHO/EIP/HRH
Niue	2004	95.00	WHO/EIP/HRH
Finland	2004	91.20	WHO/EIP/HRH
Denmark	2004	90.33	WHO/EIP/HRH
Cuba	2004	87.32	WHO/EIP/HRH
Dominican Republic	2004	83.80	WHO/EIP/HRH
Estonia	2004	80.88	WHO/EIP/HRH
Bulgaria	2004	80.70	WHO/EIP/HRH
Argentina	2004	79.94	WHO/EIP/HRH
Colombia	2004	78.00	WHO/EIP/HRH
Germany	2004	77.54	WHO/EIP/HRH
Syrian Arab Republic	2004	71.93	WHO/EIP/HRH

Japan	2004	71.52	WHO/EIP/HRH
Lithuania	2004	71.46	WHO/EIP/HRH
Belgium	2004	69.61	WHO/EIP/HRH
Croatia	2004	67.96	WHO/EIP/HRH
France	2004	67.87	WHO/EIP/HRH
Tokelau	2004	65.40	WHO/EIP/HRH
Czech Republic	2004	65.30	WHO/EIP/HRH
Luxembourg	2004	64.14	WHO/EIP/HRH
Andorra	2004	62.25	WHO/EIP/HRH
Slovenia	2004	59.27	WHO/EIP/HRH
Italy	2004	59.13	WHO/EIP/HRH
United States of America	2004	58.95	WHO/EIP/HRH
Canada	2004	56.18	WHO/EIP/HRH
Philippines	2004	56.16	WHO/EIP/HRH
El Salvador	2004	55.70	WHO/EIP/HRH
The former Yugoslav Republic of Macedonia	2004	55.28	WHO/EIP/HRH
Venezuela	2004	55.27	WHO/EIP/HRH
Jordan	2004	54.99	WHO/EIP/HRH
Cook Islands	2004	54.68	WHO/EIP/HRH
Latvia	2004	52.96	WHO/EIP/HRH
Ireland	2004	51.90	WHO/EIP/HRH
New Caledonia	2004	50.26	WHO/EIP/HRH
Austria	2004	49.70	WHO/EIP/HRH
Switzerland	2004	48.35	WHO/EIP/HRH
Panama	2004	48.00	WHO/EIP/HRH
Netherlands	2004	46.98	WHO/EIP/HRH
Hungary	2004	45.92	WHO/EIP/HRH
Albania	2004	44.53	WHO/EIP/HRH
Slovakia	2004	44.08	WHO/EIP/HRH
Belarus	2004	43.99	WHO/EIP/HRH
Portugal	2004	43.63	WHO/EIP/HRH
Spain	2004	43.04	WHO/EIP/HRH
Chile	2004	42.71	WHO/EIP/HRH
Australia	2004	42.37	WHO/EIP/HRH
New Zealand	2004	41.97	WHO/EIP/HRH
Costa Rica	2004	41.51	WHO/EIP/HRH
Malta	2004	40.41	WHO/EIP/HRH
United Kingdom of Great Britain and Northern Ireland	2004	40.31	WHO/EIP/HRH
French Polynesia	2004	39.43	WHO/EIP/HRH
Ukraine	2004	39.11	WHO/EIP/HRH
Republic of Korea	2004	38.52	WHO/EIP/HRH
Qatar	2004	37.24	WHO/EIP/HRH
Paraguay	2004	35.60	WHO/EIP/HRH

United Arab Emirates	2004	33.16	WHO/EIP/HRH
Tonga	2004	32.48	WHO/EIP/HRH
Russian Federation	2004	31.90	WHO/EIP/HRH
Republic of Moldova	2004	31.01	WHO/EIP/HRH
Poland	2004	30.40	WHO/EIP/HRH
Georgia	2004	29.59	WHO/EIP/HRH
Nicaragua	2004	29.00	WHO/EIP/HRH
Kuwait	2004	28.60	WHO/EIP/HRH
Wallis and Futuna Islands	2004	28.28	WHO/EIP/HRH
Algeria	2004	28.20	WHO/EIP/HRH
Kazakhstan	2004	27.92	WHO/EIP/HRH
Egypt	2004	27.20	WHO/EIP/HRH
Singapore	2004	26.48	WHO/EIP/HRH
Azerbaijan	2004	25.72	WHO/EIP/HRH
Barbados	2004	23.70	WHO/EIP/HRH
Armenia	2004	22.99	WHO/EIP/HRH
Turkey	2004	22.89	WHO/EIP/HRH
Turkmenistan	2004	22.83	WHO/EIP/HRH
Romania	2004	22.54	WHO/EIP/HRH
Kyrgyzstan	2004	21.56	WHO/EIP/HRH
Uzbekistan	2004	20.87	WHO/EIP/HRH
Bahrain	2004	20.77	WHO/EIP/HRH
Guam	2004	20.25	WHO/EIP/HRH
American Samoa	2004	19.53	WHO/EIP/HRH
Tuvalu	2004	19.11	WHO/EIP/HRH
Iran (Islamic Republic of)	2004	19.08	WHO/EIP/HRH
Saint Kitts and Nevis	2004	18.46	WHO/EIP/HRH
Guatemala	2004	18.40	WHO/EIP/HRH
Mongolia	2004	18.32	WHO/EIP/HRH
Antigua and Barbuda	2004	18.20	WHO/EIP/HRH
Samoa	2004	17.50	WHO/EIP/HRH
Tajikistan	2004	17.11	WHO/EIP/HRH
Honduras	2004	16.80	WHO/EIP/HRH
Bosnia and Herzegovina	2004	16.70	WHO/EIP/HRH
Ecuador	2004	16.60	WHO/EIP/HRH
Saudi Arabia	2004	16.58	WHO/EIP/HRH
Brunei Darussalam	2004	14.37	WHO/EIP/HRH
Comoros	2004	14.00	WHO/EIP/HRH
Libyan Arab Jamahiriya	2004	14.00	WHO/EIP/HRH
Mauritius	2004	13.50	WHO/EIP/HRH
Belize	2004	13.32	WHO/EIP/HRH
Micronesia (Federated States of)	2004	13.00	WHO/EIP/HRH
Tunisia	2004	13.00	WHO/EIP/HRH
Seychelles	2004	12.20	WHO/EIP/HRH

Iraq	2004	11.27	WHO/EIP/HRH
Oman	2004	11.05	WHO/EIP/HRH
Palau	2004	11.00	WHO/EIP/HRH
Peru	2004	11.00	WHO/EIP/HRH
South Africa	2004	10.46	WHO/EIP/HRH
Mexico	2004	9.63	WHO/EIP/HRH
Malaysia	2004	9.32	WHO/EIP/HRH
West Bank and Gaza Strip	2004	8.97	WHO/EIP/HRH
Grenada	2004	8.60	WHO/EIP/HRH
Trinidad and Tobago	2004	8.40	WHO/EIP/HRH
Bolivia	2004	8.16	WHO/EIP/HRH
Jamaica	2004	8.00	WHO/EIP/HRH
Morocco	2004	7.79	WHO/EIP/HRH
Marshall Islands	2004	7.70	WHO/EIP/HRH
Bahamas	2004	7.20	WHO/EIP/HRH
Saint Lucia	2004	6.20	WHO/EIP/HRH
Solomon Islands	2004	6.00	WHO/EIP/HRH
Dominica	2004	5.60	WHO/EIP/HRH
Saint Vincent and the Grenadines	2004	5.30	WHO/EIP/HRH
Sao Tome and Principe	2004	5.20	WHO/EIP/HRH
Kiribati	2004	4.90	WHO/EIP/HRH
Northern Mariana Islands	2004	4.30	WHO/EIP/HRH
Lao People's Democratic Republic	2004	4.08	WHO/EIP/HRH
Namibia	2004	4.00	WHO/EIP/HRH
Fiji	2004	3.98	WHO/EIP/HRH
Guyana	2004	3.90	WHO/EIP/HRH
Pakistan	2004	3.12	WHO/EIP/HRH
Afghanistan	2004	3.01	WHO/EIP/HRH
Sri Lanka	2004	2.50	WHO/EIP/HRH
Botswana	2004	2.24	WHO/EIP/HRH
Kenya	2004	2.20	WHO/EIP/HRH
Myanmar	2004	2.10	WHO/EIP/HRH
Mauritania	2004	2.00	WHO/EIP/HRH
Swaziland	2004	1.92	WHO/EIP/HRH
Nigeria	2004	1.90	WHO/EIP/HRH
Papua New Guinea	2004	1.69	WHO/EIP/HRH
Cambodia	2004	1.59	WHO/EIP/HRH
Djibouti	2004	1.54	WHO/EIP/HRH
Cape Verde	2004	1.50	WHO/EIP/HRH
Zambia	2004	1.30	WHO/EIP/HRH
Haiti	2004	1.20	WHO/EIP/HRH
Senegal	2004	1.20	WHO/EIP/HRH
Yemen	2004	1.19	WHO/EIP/HRH
Indonesia	2004	1.14	WHO/EIP/HRH

Democratic Republic of the Congo	2004	1.10	WHO/EIP/HRH
Equatorial Guinea	2004	1.00	WHO/EIP/HRH
Guinea-Bissau	2004	0.90	WHO/EIP/HRH
Suriname	2004	0.90	WHO/EIP/HRH
Mozambique	2004	0.76	WHO/EIP/HRH
United Republic of Tanzania	2004	0.70	WHO/EIP/HRH
Sudan	2004	0.69	WHO/EIP/HRH
Togo	2004	0.53	WHO/EIP/HRH
Gambia	2004	0.50	WHO/EIP/HRH
Lesotho	2004	0.48	WHO/EIP/HRH
Guinea	2004	0.47	WHO/EIP/HRH
Madagascar	2004	0.46	WHO/EIP/HRH
Cameroon	2004	0.40	WHO/EIP/HRH
Sierra Leone	2004	0.39	WHO/EIP/HRH
Uganda	2004	0.30	WHO/EIP/HRH
Burkina Faso	2004	0.29	WHO/EIP/HRH
Benin	2004	0.29	WHO/EIP/HRH
Central African Republic	2004	0.21	WHO/EIP/HRH
Ghana	2004	0.20	WHO/EIP/HRH
Somalia	2004	0.19	WHO/EIP/HRH
Niger	2004	0.18	WHO/EIP/HRH
Zimbabwe	2004	0.12	WHO/EIP/HRH
Mali	2004	0.10	WHO/EIP/HRH
Eritrea	2004	0.09	WHO/EIP/HRH
Ethiopia	2004	0.09	WHO/EIP/HRH
Liberia	2004	0.08	WHO/EIP/HRH
Rwanda	2004	0.05	WHO/EIP/HRH
Malawi	2004	0.03	WHO/EIP/HRH
Chad	2004	0.02	WHO/EIP/HRH
Angola	2004	0.00	WHO/EIP/HRH

Several dentists have noticed this epidemic of people suffering around the world from improper knowledge of dental hygiene and oral diseases. The approach of dentists, especially from more fortunate countries in Europe and the United States, see this as their opportunity to practice their skills as a service in third world countries as seen in the chart above. The pathway taken by most dentists is similar to the Belize Project that I attended in January 2011 with the WKU Public Health Department.

CHAPTER 2

IMPACT BELIZE EXPERIENCE

From January 6-14, 2011 I had the opportunity to travel to Gales Point, Belize to participate in a three day Dental Clinic with the Belize IMPACT Project. Gales Point, Belize is a very small village located on a peninsula in the Southern Lagoon of Belize with a population of around 500 people, most of whom practice farming and fishing. The peninsula is about 3 miles long and no more than 100 yards wide, providing issues with farming and living since the water is constantly eroding the peninsula. The team members of the Belize Impact Project were WKU College of Health and Human Services professors and students from the Dental Hygiene program, Nursing program, and Pre-Dental program.

The entire project involved a full semester of training leading up to the nine-day trip. The training was different for all the fields of interest, but I was involved in the particular field of the Dental program. Tyler Jury, fellow Pre-Dental student, was the only other peer in the Dental field of study so we were able to experience an abundance of opportunities for hands on experience. In the semester leading up to January 6th we shadowed Daniel Carter DMD and dental hygienist, Bonny Petty, on the Mobile Dental Unit of Western Kentucky University where we were able to receive a taste of what we would experience on the Belize Impact Project.

The Mobile Dental Unit is a, "Dental Office on Wheels" as described by Dr. Daniel Carter DMD, primary dentist for the Mobile Dental Unit. The Unit is complete with two dental chairs, a generator for powered instruments, sterilization equipment, an X ray machine, and all

other basic dental equipment needed for clinical treatments. The Unit travels in the local community to offer free service on behalf of the WKU Institute for Rural Health Development and Research. These services vary from placing sealants on children in a local Bowling Green, KY elementary school to performing restorative dentistry in the Mennonite community 25 miles outside of Bowling Green, KY.

A specific experience that really prepared me for the Belize Impact Project was working with the Mennonite community. Dr. Carter and Mrs. Bonny Petty set up the mobile unit and offered their service to the community. Being able to observe the trust and respect the people showed toward Dr. Carter and Mrs. Petty was inspiring as they addressed their dental issues. They performed operations from cleanings to the filling of dental caries, all out of the humble office of the Mobile Dental Unit. Being involved with the Mobile Dental Unit brought a much-needed appreciation before traveling to Gales Point with the Impact team. I saw a huge depravity of proper dental care that existed merely 30 miles from the city of Bowling Green, KY where I attend Western Kentucky University, but I knew it would hardly compare to what the Impact team and I would experience in Gales Point, Belize.

On the day of arriving in Belize my eyes were very much opened to the issues that the country was experiencing in proper dental practices. During the first few days we spent in Belize we were able to become accustomed to the culture and history of the country. It involved hearing stories and visiting museums, but from the dental research aspect of the trip we noticed that the cheapest and most frequently consumed food products were often the most detrimental to a persons oral health. These were foods that contained high amounts of sugar such as cookies, taffy, and sweet crackers. We were able to see from the very start an initial problem with the people, especially children, and their lack of knowledge on how daily habits affect their teeth.

Before setting up our clinics in Gales Point, we met with the Belize Ministry of Health. The Ministry of Health is the primary universal health care provider for the country of Belize. Their mission statement reads, "We envision a National Health Care system which is based upon equity, affordability, accessibility, quality, and sustainability in effective partnership with all levels (sectors) of government and the rest of society in order to develop and maintain an environment conducive to health." Since we were traveling strictly to provide dental care, alongside the nurses and doctors providing medical care, they wanted to meet with us to discuss our plans and express their mission. From the session the students were able to attend, I learned that Belize suffers from severe dental caries, oral cancer, and a lack of education on proper oral hygiene. The Ministry of Health was seeking to address these issues, especially in rural areas such as Gales Point, Belize. Also, I learned that only licensed dentists are authorized to practice dentistry in Belize, yet there was no dental school in the country. Overall the meeting was very effective and allowed Dr. Carter to express our initiative and how we planned to aid the Ministry of Health in their mission.

Upon arrival, by two-hour bus ride, to the Peninsula of Gales Point, Belize we were welcomed with open arms by the locals. Many of the locals had grown accustomed to the Impact team coming to the village and offering their services, as the trip had become a yearly project for service learning at WKU almost 10 years ago. The clinic began Monday January 10, 2011 and would continue till January 12, 2011. The clinics would go from 9:00am to about 5:00pm with non-stop patients for either cleanings or extractions. The ages of the patients varied for those that came for cleanings, but the ages of the local people that came for extractions were very young on the average. Over the course of the three days in clinic, there were over 10 children that needed teeth pulled very badly due to extreme cavities and decay of their lower

molars. However, almost all the children were either too small to handle the anesthetic or the extraction process was begun but then unable to be finished due to the child complaining of too much pain.

Another problem that seemed to be a common theme was the lack of time we had to address all the patients. With only one licensed dentist, one licensed dental hygienist, and five students there was no way to address all of the Gales Point residents that were seeking dental attention. At the end of every clinic day Dr. Carter was very exhausted as well as the others, and there were always patients left waiting till tomorrow. Luckily on the last day of clinic we were provided with reinforcements from the Ministry of Health dentists.

The Ministry of Health came to provide assistance in the dental clinic but specifically with the cleaning, charting, and oral hygiene education of the children in Gales Point. There were two dentists, one from Guatemala and the other from Cuba, who set up portable dental chairs and saw almost every child in the village. Tyler Jury and I helped chart the children's oral condition prior to the dentists teaching proper brushing techniques and finishing with a fluoride application. The help was much needed and very beneficial for the Ministry of Health's mission in providing sustainable care as they taught the young generation proper oral hygiene. However, as the day ended there was one very sad realization. The Belize Impact team clinic had come to a stop and the Ministry of Health had made their visit and would not return for another month and a half. This is because they are working elsewhere to try and meet the overwhelming need for dental care. So every person in the village that went untreated and was suffering from severe pain would not receive help until the Ministry of Health returned almost two months later. And with our team leaving until the next year there were at least a dozen people in this small village that would continue to suffer unless they had the ability to travel to Belize City and seek

treatment. Therefore one cannot help but question the Ministry of Health mission in being sustainable or accessible as the villagers were left with nobody to treat their dental needs nor would they be able to access a dentist anywhere near their village for one a month and a half.

CHAPTER 3

EMPOWERMENT TRAINING IN HYDERABAD, INDIA

So the question is, "how can these people be properly treated in regards to being accessible and sustainable in their community?" My father, Charles Vittitow DMD, has seen the need for dental care in these less fortunate countries and decided to take action. He first adopted the philosophy of most dentists that participate in what is considered short-term overseas mission work. He would travel to third world countries such as Jamaica, Nigeria, Afghanistan, India, and Ghana to offer his dental services. There he would offer free dentistry for around 7-10 days, much like the dentists on www.dentaltrainingformissions.com. While this helped a handful of people, he was unsettled by his work and said, "The process was so exhausting. I was not able to speak to anyone I helped due to time constraints and language barriers and at the end of each day there was always a large group of people I was unable to treat." This process of offering dental care is noble, even praiseworthy but many dentists are now adopting a new form of dental care that offers very positive and powerful results.

The idea of Empowerment was first introduced to me on a mission trip to Hyderabad, India with Charles Vittitow DMD in January of 2009. We traveled to India for 10 days to meet up with Caleb, the senior pastor and local missionary that Southeast Christian Church of Louisville, KY was sponsoring. While there I was able to participate and observe as Dr. Vittitow gave classroom educational sessions and clinical hands on experience to 5 men that were leaders in the villages surrounding Hyderabad, India. The 5 men were chosen by Caleb and the local

church to be men of high honor and great respect in their communities. They would be using their newly developed skills to provide support for the people in their villages and treat the severe dental issues that were running rampant in the villages.

The curriculum for educating and empowering these men had been tested on men in Hyderabad, India two years prior and had proved to be successful. As Dr. Vittitow taught using non-verbal videos, translation from English to Hindi, and demonstrations, the 4 dentists he had trained two years prior joined in teaching the others how to perform excellent "lay dentistry". The outline of curriculum for empowering lay dentists in third world countries can be seen in the attached training program.

The training program seen in the table 3.1 has been in existence since 2005 through the efforts and partnerships of mPower Ministries. This training program began in Tamale, Ghana, an area identified as needing better oral health care in remote and rural villages. Men were chosen as leaders in their community to help in the process of finding the right men to participate in the program. Individuals needed to be interested in the training program and committed to providing services once trained as lay dentists. Most of the men chosen to participate were supported financially by faith-based organizations. Permission was always granted from the local authorities in each country prior to the training of the lay dentists.

The program is mostly universal regardless of the country of implementation. The program possesses two phases, one focuses on oral disease prevention and the second focuses on Exodontia (study of extracting teeth).

The Exodontia training program is made up of four main phases: 1) patient consent and assessment, 2) risk management and infection control procedures, 3) local oral anesthesia, and 4) extraction techniques. Phase, 1 the patient assessment unit, includes introductory presentations

on infections, oral systemic links, and obtaining consent for treatment and medical histories. Patient assessments focus a great deal on how to cope with risks that may exist and when to not attempt extractions. For phase 2, the infection control unit, a detailed presentation of disease transmission, instrument sterilization, and safe clinical practices such as barrier techniques and sharps safety is explained through translation and educational videos. Disease and infection control is a "no exception" practice that will fail a student if not performed properly. Phase 3, the local anesthesia unit, includes basic anatomy of the head and neck with special attention to cranial nerves, pain control, and maxillary infiltration and mandibular block anesthesia. The fourth and final phase of Exodontia, involves teaching dental anatomy, instrumentation, pre-operative evaluation and post-operative instructions. Throughout all the teachings of Exodontia, a specific emphasis is put on being sensitive to the patient and showing compassion.

Conditions and equipment are typically very basic and primitive compared to the United States and other western countries for the trainings. Church or school buildings are usually the training sites because they possess electricity and allow the use of a projector and open spaces for didactic presentations and clinical demonstrations. Everything used in teaching and clinic is portable and must have its own energy source since clinics are moved to several different villages from day to day. An infection control practice is emphasized and consists of very specific recommendations and guidelines involving solutions of sodium hypochlorite for instruments, using disposable supplies, disinfectant wipes, and hand sanitizer. Surgical extraction instruments (elevators, root tip picks, forceps and curettes) are always accessible whether in training or clinic. Radiographic capability is not included in the training simply because it would never be accessible to the lay dentists. Without radiographs, a major emphasis of the training program is the primary use of elevators rather than forceps to avoid breaking off

root tips. Additionally, the lay dentists are trained to always evaluate the roots of the teeth at the time of extraction to ensure complete removal of the entire tooth. In order to secure complete removal in all situations, root tip extraction is also an essential part of the training process.

In Hyderabad, there were 4 days of clinic in 4 different villages with no less than 100 people needing to be seen every day. There were 5 chairs set up and five newly trained dentists manning the dental chair. It was time to take what they learned in the training program and apply it in clinical practice. Over the course of the clinics the new dentists were given cases that were manageable and safe to be performed. Dr. Vittitow and the previously trained dentists were overseeing every operation and coached them in every tough situation. The men were extracting on average 15 teeth by themselves every day and educating a vast majority of the village on prevention against dental caries, tooth loss, and oral cancer. They educated through teaching how to brush properly and how to avoid foods that expedited decay.

Through the week I was able to observe the progress of the newly trained dentists. The lay dentists struggled at first but as they were able to learn from Dr. Vittitow, and most of all their fellow countrymen that had experienced success in the same field, they developed a sense of confidence and self worth as they were passed on skills that would undoubtedly relieve pain from their fellow villages and prepare a more healthy future for others.

CHAPTER 4

ANSWERING THE CALL AND THE PROBLEMS FACED

Kamliot and Leiner (1992), two accredited dentists and published authors, share the philosophy of empowerment and show a new form of bringing dental care to the third world. They discuss the alternate forms of dental health care in the Third World, specifically Central America, by recording the work of the Association for the Promotion of Community Development for Central America (APDCA). The APDCA is an organization that focuses on empowering residents of poor communities in Central America to provide a range of educational and curative dental services. From root canals to making dentures, the APDCA has helped all types of people to restore their oral health.

The APDCA believes that all people have a right to dental health care while recognizing that even in wealthier nations the majority of people cannot afford even basic dental check-ups. APDCA went straight to the problem and began in the slums of El Salvador. Kamliot, the founder of APDCA, trained the first group of 10 village leaders to perform basic dental services such as scalings, fluoride application, and tooth extractions. Through this training, El Salvador became the most thriving APDCA program. They now operate 13 full-service dental clinics and see about 2,000 patients per month charging modest fees that only cover materials.

APDCA has shown great results in adopting the theme of empowerment. In consistently attending to their 2,000 patients per month, they performed over 18,000 fillings in their first six

months. People's needs were met simply because an accredited dentist, Kamliot, trained a group of lay people on how to offer basic dental services and then sent them into the field to practice what they were taught. After the success he had in Central America, Kamliot concludes his article with saying, "Our model can be reproduced in other Third World nations, wherever people are still deprived of their basic right to oral health care" (Kamliot 1992).

The same types of empowerment are being promoted in other parts of the world. Saparamadu, a native of Sri Lanka, sees a huge need for dental care in his home country where he watches his own people die of diseases regarded as too expensive to treat. He expresses that he wants something to be done.

Saparamadu writes on the dental services in third world countries and states his purpose by saying; "Oral health promotion and its maintenance assume vital importance since freedom from oral disease contributes substantially to the general well-being of the individual" (Saparamadu 1986). Saparamadu seeks to promote oral health maintenance by pressing toward "Health for All by the year 2000" (Saparamadu 1986), meaning health for all the people in Sri Lanka. "Health for All" (Saparamadu 1986) is an ambitious goal but Saparamadu proposes the idea of "The Village Health Volunteer Program" (Saparamadu 1986). This program classifies the basic needs for the delivery of dental care as "health promotion, disease prevention, treatment, and rehabilitation" (Saparamadu 1986). The program's main philosophy is to give everyone the right to know about their own health, but it is their own duty to take responsibility for their health.

With this philosophy in mind, the Village Health Volunteer Program seeks to maintain dental health in rural areas not near dental clinics by training a community leader for each village, which offers a different approach. This leader will be educated in properly diagnosing

and treating problems such as first aid for those suffering from post-extraction hemorrhages and giving aspirin to those with fever. Also, the community leader will be provided with medicine and some basic tools. However, any serious problems will be referred to an accredited dentist. This lowers the responsibility of the few accredited dentists in Sri Lanka. Saparamadu says; "By this process the health professionals underplay their roles and attempt to change the health care model from one of authoritarianism to one of participation" (Saparamadu 1986). This approach, which differs from the APDCA, focuses more on educating people in maintaining good oral health than treating hundreds of people every day.

This idea of education is expected to be effective according to Saparamadu who believes this will be well accepted within a culture that is prominently Buddhist like in Sri Lanka. In Buddhist society, helping the sick is a praiseworthy deed. Oral exercises, such as brushing and flossing techniques, are even practiced in Sunday schools run by monks to fulfill the teachings by Buddha of body cleansing.

Education is the most important aspect of accomplishing "Health for All" according to Saparamadu who states, "For the efficient delivery of oral health care services in rural areas, more emphasis has to be given to the prevention of oral disease than the treatment of its consequences" (Saparamadu 1986). By advertising the effects of cariogenic foods such as chocolates and sweets the Village Health Volunteer Program seeks to educate people on how to prevent oral disease. But the VHVP knows they cannot reach enough people alone so they make sure to state that, "It should be realized that the oral health of a community couldn't be treated by the health sector alone" (Saparamadu 1986).

The previous quote reiterates the fact that just a few dentists or one health sector cannot treat a significant amount of people. The dentists that try to treat people by their own power

seem to only exhaust themselves and come up short. Instead they should adopt the philosophy of groups like APDCA or the Village Health Volunteer Program that don't rely on their own power but instead seek to empower others. However, many dentists, especially American Dentists, see people of third world countries as incapable of performing quality dentistry.

In regards to dentistry outside the U.S. there is an article published in the *Journal of the American Dental Association* that discusses the problems of dental treatment outside the United States. It addresses a study done to caution people who are seeking dental treatment outside the U.S. in order to receive cheaper dental care, by breaking your decision into three sections. The sections included information on the difference in American dentists with the rest of the world, the things to consider when seeking dental care abroad, and how to prepare for dental care outside the United States. While this study seeks to keep Americans in the U.S. for dental care, it also shows why many accredited dentists want to take the problems of dental care in the world upon their own shoulders.

My father, Charles Vittitow DMD, has seen this mindset take root in many American dentists. They recognize a need for dental care to be brought to the third world countries, but will not join him in empowering others to meet this need. They do not think that people are authorized to make a diagnosis or have the knowledge on how to practice sterile technique. They ask my father the question, "How can you expect these people to practice quality dentistry after only a few weeks of training when it takes an American dentist several years?" Dentists practicing in the United States are required to attend an accredited dental school, must receive a license to practice, and are put through extensive board examinations. The standard of care is also much higher for those in the United States. For example, dentists in the U.S. follow sanitary guidelines to prevent blood born diseases from spreading between patients. The "Traveler's

Guide to Safe Dental Care," (2006 ADA Journal) shows information of how many patients are treated by dentists in other countries and measures the quality of care they offer. In the majority of third world countries, qualified dentists treat less than 75 percent of the population and the educated dentists are not monitored near as closely on their sanitation. In America, almost 70 percent of the population visits the dentist each year. Another reference is the International Association for Medical Assistance to Travelers (IAMAT) that introduces a reference to a network of credible hospitals and clinics around the world. Areas such as Europe, Australia, and America show to have several credible dentists but third world countries have very few. The article also provides the website, www.iamat.org, for information on the medical care in different countries.

This take on dentistry outside of the U.S. is very prideful. There may be very few dentists that are as well educated as the dentists of America but simply because American dentists attend more school does not mean they are the only dentists that can practice quality dentistry. American dentists must also realize that people around the world are not looking to have the typical American smile, but instead just want their tooth decay to be taken away and prevented. My father even said, "It only took me a few days to learn basic things such as extracting a tooth or giving a shot." The real problem is not that residents of third world countries are incapable of practicing quality dentistry but instead that they have not been given the resources or ever been taught. With 80 percent of people in third world countries living in rural areas (Ministry of Health 2009) the people need affordable dentistry that can treat their problems and not cost them their life savings.

The issue of low income families in third world countries not having the income to access proper dental care is investigated by authors Yee and Sheiham. The researchers found that most

children are uneducated on how to properly brush their teeth and the effects certain foods have on their oral health. Though the disease in children seems to mostly occur on the lingual surfaces (the surfaces of their teeth on the tongue side) more than 75 percent of dental care remains untreated in the third world. Restorative dentistry in less fortunate countries would cost somewhere around $1618 in US dollars for children from 6 to 18 years old.

This information is significant because it reveals that people of rural areas are uneducated on how to maintain proper oral hygiene and have accepted that it is too expensive to restore their damaged teeth. According to Peterson (2005), with almost all dental problems being unaddressed in rural countries people will continue to show their children that poor oral health is a way of life. How will only a few dentists be able to break the trend of people not maintaining oral hygiene?

The study concluded by noting there is no way for the children to be treated when dental care cost this much and many countries do not have sufficient resources to finance such health care. Since dentistry is too expensive for people to afford, they state in their final paragraphs, “It would be very helpful to have someone help them treat a disease causing issue“ (Peterson 2005).

It would be extremely optimistic to say that all the dental problems of the third world could be treated but from Yee and Sheiham’s previous quote it is obvious that people are calling out for help. Imagine if a few experts began educating and empowering people on how to take care of their teeth and started a trend of good oral health among families. It would only reach a few at first, but eventually people would learn the preventive actions they can take to avoid oral diseases. People can start to wake up every morning with no pain in their teeth. This would slow down the rate of oral diseases and start to breed more healthy people and families.

Unfortunately, the rate of dental related diseases is rapidly increasing in countries where no dental education has been offered. With these diseases in mind, Sheiham addresses the issue of dental caries (tooth decay) and the spreading of dental disease in underdeveloped countries. Sheiham states that the incidence of dental caries is increasing at a rapid rate in underdeveloped countries and has decreased by about 40% in developed or industrialized countries in the past ten years. He accredits sugar consumption to the increase in dental caries.

The problem proposed in this situation by Sheiham is not the lack of dental care, but simply the lack of education on how to properly care for one's teeth. This is a perfect opportunity for an accredited dentist to pass on his knowledge to a few village leaders and let them help their own people. By simply telling people that the foods they eat will cause tooth decay you can give people reason to start practicing good oral health. The reaching out of a well-educated man could impact an entire village by teaching them to take action to prevent disease and even death.

This idea of empowerment through dentistry is a challenging process that requires a great deal of planning. It must ensure an appropriate number of trained personnel, but should also be sensitive to the needs of the country or village, the cost to sustain, resources for performance, and to the final outcome of practicing the dental health resource (Maxwell 1992). In short, it should be a service that the locals need and will appreciate. Oral health treatment is often a very low priority to the people of third world therefore it is rarely integrated into united national programming (Petersen 2003) (Hobdell 2004).

CHAPTER 5

GHANA STUDY

Ghana, Africa is a perfect example of a third world nation with a lack of dental health care. As a sub-Saharan country in West Africa with Ghana only has 0.2 dentists per 100,000 people and the majority of those dentists are located in the capitol of Accra, Ghana. Ghana is a democratic county with credible and independent magistrates, active civil society, free press, and a political military, and has strong stability (USAID website). However, the country still has significant health care needs. As reported in the Report of the Ghana Macroeconomics and Health initiative, 37% of the rural population has access to any sort of health service and 42% have access to clean water (Government Economics Report 2006). HIV/AIDS is a huge issue that accompanies many preventable communicable diseases and malnutrition. The estimated life expectancy of 57 years is astonishing and proposes an additional problem of costing the country close to $620 in annual output. Alongside this are additional negative effects regarding poor health that reduce productivity and devlopment in the country of Ghana as well as many sub Saharan African countries (Cole and Neumayer 2005) (McCarthy 2000) (Bhargava (2001).

A 2006 report from the Global Health Workforce Alliance (WHO Report 2006), it was stated that Ghana possessed a severe shortage of skilled health professionals, with only 393 Dentists. For 2011, there were no new dentists reported. In a 2006, a report was released stating that Ghana had a lack of consensus on oral health professionals needed. Ghana also can't retain

their oral health professionals. The one dental school at the University of Ghana graduated about 7 dentists per year on average for the past 7 years.

With such great need, Charles Vittitow DMD saw an opportunity to provide his services to an underserved country. In 2006 Dr. Vittitow trained 6 Ghana natives that were pastors and leaders in the local community. He followed the training curriculum as seen in the mPower training curriculum attachment (figure 3.1) and allowed the men to practice in their local communities. They have been practicing dentistry ever since and have done extractions at a rate of about 10 per week since their training. Then in May of 2009 Dr. Vittitow paired up with Dennis Scharine DMD and University of Kentucky professors Robert Kovarik DMD and Judy Skelton PhD, RDH to perform a research study on the effectiveness of the trained lay dentists.

The study involved a sympathetically sound system that met the dental needs for the villages involved in the study and provided no harm. Therefore, the study was designed to evaluate clinical and subjective patient outcomes.

The study took place in Tamale, Ghana. I traveled to Ghana in May of 2009 with Dr. Vittitow and Dr. Scharine and they joined forces with the six previously trained clinicians. Together, these eight men traveled to four separate villages in remote areas to perform extractions under identical conditions. To note, the US dentists possessed 27 years of dental experience each. Of the sites where the study took place, three were outside and one was inside and all portable equipment was used with only ambient light available. One US citizen using an interpreter when needed collected initial patient data. All patients were assigned a number, which was recorded on their charts and coded into a logbook that was kept separate from the patient charts. Patients were randomly assigned to one of the clinicians for evaluation and extraction if necessary. Following extractions, Robert Kovarik DMD of the University of

Kentucky College of Dentistry performed both three day and seven day post operative evaluations. Dr. Kovarik was blind to the clinician who performed the extraction and evaluated using a standard written set of questions and criteria.

The patient population consisted of 320 Ghanaians. The patients sought care for oral pain whether it was associated with swelling, bleeding, broken tooth, or other conditions. Of the 320 treated, 304 were evaluated 3 days post operative (95%) and 265 were evaluated 7 day post operative (82.8%). The review of the dental operations yielded the following results:

Figure 2.1

	Number	% of total	Average Age	SD
Total # of Extractions/Patients	**304**		42.8	±16.9
Male	136	44.7%	43.9	±18.8
Female	168	55.3%	42.0	±15.2

		Total	**US Dentist**	**Ghanaians**
Teeth Extracted		304	146	158
			48.0%	52.0%
	Molars	236	112	124
	Premolars	43	20	23
	Canines	1	0	1
	Incisors	24	14	10
	Total	304	146	158
Avg Time of Extraction	Minutes	6.6	4.8	8.2
	Std Dev	±7.8	±5.2	±9.2

At the 3-day and 7 day postoperative visits, patients were questioned about their pain, trismus, and satisfaction with their treatment. Responses went as followed:

Figure 2.2

Questions asked of all patients who received extractions	"Yes" response of pts treated by US dentists	"Yes" response of pts treated by Ghanaians
Pain from your dental problem is gone or less than what is was? (3d)	94.3%	93.0%
Were you able to resume your normal daily activities? (3d)	96.5%	96.8%
Do you have difficulty opening your mouth? (3d)	5.7%	6.4%
Are you satisfied with your treatment? (3d)	100%	98.7%
Pain from your dental problem is gone or less than what it was? (7d)	93.0%	88.6%
Do you still have any swelling? (7d)	0.8%	4.5%
Do you have any difficulty opening your mouth? (7d)	0.8%	4.5%
Was your chief complaint resolved with your dental treatment? (7d)	100%	100%

The results of the clinical post-operative evaluations were as follows:

Figure 2.3

Outcome Measure	Patients treated by US dentists	Patients treated by Ghanaians
Clinical signs of infection remain (3d)	21.4%	26.3%
Clinical signs of infection remain? (7d)	3.9%	12.1%
Clinical signs of bone or tooth fragments at extraction site (3d)	5.0 %	7.1%
Clinical signs of bone or tooth fragments at extraction site (7d)	7.8%	9.1%
Moderate-Severe pain remains at extraction site (3d)	18.6%	22.4%
Moderate-Severe pain remains at extraction site (7d)	10.9%	17.4%
Bleeding remains at extraction site (3d)	0.7%	1.9%
Bleeding remains at extraction site (7d)	0%	0.8%
Clinical signs and symptoms of dry socket (3d)	0.7%	6.4%
Clinical signs and symptoms of dry socket (7d)	8.6%	15.0%

There were statistical differences between U.S. Dentists and Ghanaians in regards to the amount of time needed for operation. Signs of infection or dry sockets were present significantly more often in patients treated by the Ghanaian dentists at the 7 day evaluation than the patients treated by the U.S. Dentists. All other measured differences between the US dentists and the

Ghanaians were not statistically significant at a $p < 0.05$ significance level (Skelton and Kovarik 2011).

Without the use of radiographs, root fragments could only be assessed by careful observation. However, if known root fractures were left they there were always removed prior to closure.

From the study we can make the following assessments. Oral health care is limited to non-existent in Ghana, Africa and most resource challenged countries in the third world category. This study and the training of the Ghanaian clinicians have provided research that will serve the country well alongside the treatment of over 300 patients in 4 days. In response to this documented need, a focused dental training program was initiated in areas where there was both need and commitment from local leaders. The necessary permission was granted from the government authorities prior to the initiation of the study. Local residents were identified and sponsored to participate in the training and program evaluation took place to ensure that the program was beneficial and did not cause pain and/or suffering.

Though there were some significant results present in the negative for the Ghanaians, there are several factors that must be taken into consideration. The two US dentists possessed over 50 years of experience when combined, compared to the 3 years of experience in extracting teeth. Due to the lack of experience the lay dentists took longer to perform operations, making their patients more susceptible to infection and dry sockets. Another factor that is not documented is the extent and severity of infection and decay prior to extraction. The tooth decay in almost all the patients was already extremely severe and could have played a role in the infection and dry socket evaluation.

With the results of the study and the factors that affected it, it shows with great confidence that the study proves that the empowerment theory of passing on dental skills to the right people in third world countries can bring relief to those in pain and help educate those in third countries that lack the resources or knowledge of proper dental health care. Dental disease is an issue that is running rampant in countries that lack proper health care. It is without question that further problems will develop unless action is taken.

CHAPTER 6

CONCLUSION

Oral health is seen as a future issue that will lead to much disease and death in many rural areas. Sheiham states he would like to see, "…policies against children consuming too much sugar, policies to ensure availability of oral health supplies, and a reduction of dentists in industrialized countries" (Sheiham 2003). By this statement he is calling out for help from dentists that are practicing where people are properly taking of their teeth. Though it would be great to have a dentist on hand in every village, if a dentist from an industrialized country would simply educate people then he or she would be treating them for a lifetime.

The Empowerment Theory has been tested and proven in Ghana, Africa and is being performed in other countries around the world. With a successful model and program in tact, there is no reason this theory cannot be implemented in other third world countries that lack the education, resources, and professionals, granted the government allows.

The philosophy of empowerment by education is studied by the three authors Gherunpong, Tsakos, and Sheiham who believe that the normal methods of meeting dental needs do not correspond to helping with the health and needs of the people. They seek to develop and test a new system that meets the overall dental needs particularly for school children in

underdeveloped countries. They conducted a survey assessing the average school child's dental hygiene, then offered them access to fluoride and educated them on proper dental care. They found the results to be very efficient by having minimal costs and seeing great responses from the children on the education of oral hygiene.

This is a great option for utilizing the empowerment theory to educate children in poor countries at a very young age about proper dental care. According to Watt, "There is a tremendous need to empower local communities to become actively involved in efforts to promote their oral health and education is the most powerful tool to treating the epidemic of dental disease" (p.83). Many have even chosen to focus solely on education rather than treating oral problems that have existed for many years.

While most of the people that have long existing dental problems could still be treated, the idea of educating young people has shown to be very effective. Young people are positively responding to the education in areas such as Sri Lanka and Central America. According to the Ministry of Health census (2009) about 39 percent of a third world country's population is under 15 years of age. By educating young people on proper dental hygiene, the up and coming generation will be empowered to teach their own children the necessity of good oral hygiene. A few people investing the time to teach proper dental care will save a generation from a great deal of pain and decay.

While it will undoubtedly be some time before dentists can empower people around the world, many dentists are seeking to save millions of people a year by providing people with the resources and education to practice good dental care. Organizations like APDCA are helping millions of people a year by offering simple dental checkups, which were once too expensive, at an affordable price. I have also seen a great impact from my father, Charles Vittitow DMD, who

has adopted the philosophy taking 10 to 14 days to teach a few people how to practice basic dentistry. While dentists need to make money just as much as any other person needs to make a living, dentists are showing the sincerity of seeing every human life as worth saving and have seen great success. More and more people are being treated each day in areas such as Ghana, India, or Sri Lanka and citizens of other countries are continuing to be educated. Like the man with the fishing pole, educated dentists have been granted a skill that can help so many people. While treating people by their own power is praiseworthy, through teaching others they can empower people to treat dental disease for a lifetime.

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