

**ASSESSMENT OF GRADUATE SCHOOL REGISTERED PRACTICE  
MANAGEMENT COURSE EFFECTIVENESS ON FINANCIAL SUCCESS  
OF ORTHODONTISTS**

---

A Thesis  
Submitted to  
The Temple University Graduate Board

---

In Partial Fulfillment  
of the Requirements for the Degree  
MASTER OF SCIENCE in ORAL BIOLOGY

---

By  
Justyn Park, D.D.S.  
August 2022

Thesis Approval(s):

Orhan C. Tuncay, D.M.D.  
Thesis Advisor, Temple U. Kornberg School of Dentistry, Dept. of Orthodontics

Jeffrey H. Godel, D.D.S., M.S.  
Committee Member, Temple U. Kornberg School of Dentistry, Dept. of Orthodontics

James J. Sciote, D.D.S., M.S., Ph.D.  
Committee Member, Temple U. Kornberg School of Dentistry, Dept. of Orthodontics

John V. Moore III, M.Ed.  
Committee Member, Temple U. Kornberg School of Dentistry, Dept. of Orthodontics

## **ABSTRACT**

Following completion of residency, orthodontists become businessmen. In such venture, their degree of financial success is defined by the level of income production. It also affects the degree of satisfaction with their career. This study explores the influencers of income production in orthodontic practices. Specifically, it explores if matriculating in a Graduate School-listed practice management course in residency, affected their financial success. We posit, conceptual understanding of elements of success in the course yields increased earning potential in the life of an orthodontist. The objective of this study was to explore if structured business management course that includes a syllabus and multiple lectures during residency would allow orthodontists to achieve financial success quicker than those who received only anecdotal advice. Our findings might be expected to influence the orthodontic curricula.

A survey instrument of 19 questions, consisting of multiple-choice questions and visual analog scales, was designed and entered into SurveyMonkey. American Association of Orthodontists (AAO) Partners in Research Program administered the data collection to assess how comfortable and competent orthodontists were in managing their business in the first 3-years of practice. AAO Partners in Research identified 704 orthodontists who fit the inclusion criteria. They were contacted by email with the designed survey instrument. After initial distribution, another reminder email was sent to increase the response rate. For statistical analysis, Mann-Whitney analysis, Kruskal-Wallis Test followed by Post Hoc pairwise comparison, and multiple regression analyses were performed to identify any differences between those who received structured business management course and those who did not in their financial success following residency.

Out of 704 orthodontists who received the survey, 142 responded (20% response rate). The results suggest that there is no significant difference in the amount of income production in the 3<sup>rd</sup> year after graduation regardless of whether one had the practice management course in his or her residency or not ( $p=0.979$ ; sig.  $p<0.05$ ). In addition, the length of time it takes for the orthodontists to feel satisfied with their income since graduation and access to business education during residency had an asymptotic significance value of 0.170, which suggests that the differences were statistically insignificant. However, there is a significant correlation between receiving help and income production as those who had assistance, specifically from family members, earned more at their 3<sup>rd</sup> year of practice than those who did not ( $p=0.009$ ; sig.  $p<0.05$ ). Moreover, although taking practice management course during residency did not make significant differences in their income production at their 3<sup>rd</sup> year of practice, those who had taken the course felt much more comfortable with practice management topics than those who did not ( $p=0.000-0.004$ ; sig.  $p<0.05$ ).

With these results, graduate school registered practice management course is not a necessity during residency in helping graduating orthodontists to achieve financial success more quickly. Nonetheless, knowledge from the course and support from their family members certainly aid the newly graduates to feel more confident towards managing their offices in the early years of their practice.

## ACKNOWLEDGEMENTS

I would like to express my deepest gratitude to my research mentor, Dr. Tuncay, for giving me the opportunity to perform the research and for providing invaluable guidance. It was a great privilege and honor to work under your guidance. Your immense effort and desire to continuously improve and make a positive impact on our educational curriculum and learning has considerably inspired me. I am extremely grateful for the generous support you provided.

I would also like to show my appreciation to Dr. Godel for guiding us through this journey to not only prepare us as competent orthodontists but also grow as academicians. Thank you so much for taking your time and going above and beyond to review and make comments regarding our posters, presentations, and theses. I cannot appreciate enough the tremendous amount of help and support you provided.

Moreover, I express my sincere thanks to Dr. Sciote for consistently making sure I was never overwhelmed with the research process by setting timelines and providing suggestions along the way. Your comments and insights on presentation formats and delivery of information have tremendously helped me grow as a presenter and researcher.

In addition, this research would not have been possible without the help from Mr. Moore. You have always responded my questions and concerns with patience and a smile. Thank you so much for always making sure that I felt confident with the work and the results.

Last but not least, I would like to extend my special thanks to my family, friends, and co-residents for supporting and believing in me throughout this journey.

# TABLE OF CONTENTS

	Page
ABSTRACT .....	ii
ACKNOWLEDGEMENTS .....	iv
LIST OF FIGURES .....	vii
LIST OF TABLES .....	viii
CHAPTER	
1. INTRODUCTION .....	1
2. REVIEW OF THE LITERATURE .....	3
2.1 Changing Trend of Dental Practice Pattern .....	3
2.2 Dentists' Perception Towards Business Management .....	4
2.3 Dental Residents' Perception Towards Business Management .....	5
2.4 Changes in Dental School Curriculum .....	6
2.5 Current Structure of Orthodontic Residency Curriculum .....	7
2.6 Financial Success in Orthodontics .....	8
2.7 Keys to Successful Business Management .....	9
3. AIMS OF THE INVESTIGATION .....	11
4. MATERIALS AND METHODS .....	12
4.1 Survey Design .....	12
4.2 Survey Distribution .....	14
4.3 Patient Consent & Confidentiality .....	14

4.4 Statistical Analysis for Business Management and Financial Success.....	15
4.5 Statistical Analysis for Assistance and Financial Success.....	15
4.6 Statistical Analysis for Level of Comfort in Business Management.....	15
5. RESULTS .....	17
5.1 Profile of the Respondents .....	17
5.2 Results for Business Management and Financial Success.....	18
5.3 Results for Assistance and Financial Success.....	20
5.4 Results for Level of Comfort in Business Management Topics.....	22
6. DISCUSSION.....	26
6.1 Correlation between Business Management and Financial Success.....	27
6.2 Correlation between Assistance and Financial Success.....	29
6.3 Correlation in Level of Comfort in Business Management Topics .....	31
6.4 Limitations and Recommendations for Future Studies.....	35
7. CONCLUSIONS.....	38
REFERENCES CITED.....	40

## LIST OF FIGURES

Figure	Page
1. Online Survey Design .....	13

## LIST OF TABLES

Table	Page
1. General Profile of the Respondents .....	18
2. Responses on Variables for “Financial Success” .....	19
3. Mann Whitney Analysis for BM vs. Financial Income .....	20
4. Responses for Help Received After Graduation .....	21
5. Post-Hoc Pairwise Comparison for Help vs. Financial Income .....	22
6. Responses for Level of Comfort in Business Management Topics .....	23
7. Multiple Regression Analysis for BM Topics .....	25

# CHAPTER 1

## INTRODUCTION

Orthodontics is an interesting field in that as an orthodontist, one is not only expected to straighten teeth with correct diagnosis and treatment planning, but also be knowledgeable in managing and marketing one's business (Sinclair & Grady, 2001). According to a 2017 Orthodontic Workforce Report from American Association of Orthodontists, approximately 79% of the orthodontists either own or share ownership of practice (American Association of Orthodontists, 2018). However, large majority of the recent graduates are either looking for a full-time associate positions rather than starting their own practices due to student loans and difficulty in operating practices. Hence, many decide to commute several miles or even work in multiple locations while delaying practice ownership due to lack of knowledge in operating a business and managing student debt. Although the dearth of practice management knowledge provided during orthodontic training was brought into attention in the early 2000s and call for change to integrate more business-related teachings into orthodontic curricula has continued through mid-2000s by California Dental Association, still very few orthodontic programs offer structured business management course during residency (Sinclair & Grady, 2001).

Graduate-school registered business management course is defined as a syllabus-guided class that has its designated lecture times with credits for taking the course. According to Sinclair and Grady, the seminars should include wide-ranging topics consisting of practice leadership and communication, office finances, staff management, and personal finances (Sinclair & Grady, 2001). In addition to the didactics, they

recommend the course to provide opportunities for the residents to write a paper on designing their own offices and familiarize themselves with floor plans and encourage office rotation. The essence of this structured curriculum is to help the residents to graduate with a better understanding of practice management and relieve some of the stress and difficulties that they may encounter in the beginning of their practice years.

Although previous literatures highlight the lack of business education and encourage integration of practice management course into orthodontic curriculum, there has been no studies so far that explored if orthodontists drove any benefit in matriculating from programs that provided such education. As a result, in order to fully understand if there is any advantage in having practice management course during residency, this study aimed to investigate any association between offering of business management course and financial success of the graduating orthodontists. The term “financial success” is used throughout the study and is measured by two components: 1) amount of income production in the 3<sup>rd</sup> year of their practice 2) how quickly graduating orthodontists feel satisfied with their income. In addition to financial success, other variables, from family members’ assistance to level of comfort towards various business management topics, are assessed to evaluate any further correlations.

## **CHAPTER 2**

### **REVIEW OF LITERATURE**

#### **2.1 Changing Trend of Dental Practice Pattern**

More than ever, dental practice models are transforming to a decrease in solo practices and increase in group practices (Han et al., 2018). Majority of dental graduates are now secure employment as an employee of a corporate-owned organization or as an associate (Han et al., 2018). Of the half of the graduating seniors from U.S. dental schools surveyed in 2016 were planning not to start their own practice. Whereas 42% of the students wished to start as an associate, a growing percentage of 37.6% wanted to enter a group practice, and 14.5% of the students hoped to become employed by a group practice (Dunning et al., 2018). Recently, there is a growing market of dental service organizations (DSOs), which are single entities that conglomerate group practices and aid in their management (Formicola et al., 2018). The report by American Dental Association in 2017 indicated that 8.8% of U.S. dentists were affiliated with DSOs (American Dental Association, 2019). By specialty, followed by general practice, orthodontics was the second most affiliated group to the organization (American Dental Association, 2019). There is a substantial increase in these organizations as they show greater appreciation for Medicaid patients and provide benefits and information on business management, including purchasing and accounting, to the dental providers (Center for Health Workforce Studies, 2017). They also offer substantial flexibility. Dentists can decide to be employed or still own their private practices while maintaining contract with the DSO. Newly graduating dentists may find this practice model attractive as the administrators play the

role of a mentor. They steer the young dentists to focus on their clinical work and patient care while supplying support in practice management (Center for Health Workforce Studies, 2017). As most dental graduates feel that their schools prepare them well with clinical skills but lack emphasis in creating a business plan after graduation, these organizations certainly help fill those voids (Barber et al., 2011).

## **2.2 Dentists' Perception Towards Business Management**

Dentists are trained to accurately diagnose, treatment plan, and competently perform treatments to the patients during dental school (Henzi et al., 2007). Throughout the four years of dental school, dental students spend a vast amount of their time in obtaining knowledge with primary focus on clinical and biological sciences and in incorporating those skills and knowledge to actual clinical setting (Henzi et al., 2007). Several studies have been conducted thus far to investigate if there is a lack of emphasis on creating a business plan and making future career decisions upon graduation. The study by Barber et al. in 2010 aimed to explore how confident recent dental graduates of University of Michigan felt about practice management topics, including overhead and legal issues (Barber et al., 2011). The results showed that 85% of the respondents felt unprepared at the time of graduation (Barber et al., 2011). Surprisingly, one-third of the 15% of the respondents who felt prepared upon graduation in managing a practice reported that their knowledge did not come from the dental curriculum, but rather from the aid of their relatives and mentors outside of the school (Barber et al., 2011). This result is coincident with the annual survey conducted by ADEA to dental school seniors graduating in the year of 2006 as practice administration was one of the highest ranked areas that the graduating class felt most incompetent (Chmar et al., 2007). Furthermore, in the study

conducted by the University of West Indies that surveyed their dental alumni from 1994-2002, practice management was ranked among the lowest in terms of the level of their competency (Rafeek et al., 2004). Thus, results from previously conducted studies propose changes in the curriculum to better educate the students regarding topics outside of hand skills and clinical knowledge.

### **2.3 Dental Residents' Perception Towards Business Management**

Dental residents' perception towards business management is no different from the recent dental graduates' grasp of these topics. In the article by Bryan et al. in 2010, they surveyed all residents at University of California, Los Angeles (UCLA) post-doctoral residency programs in 1997 and 2005 to examine their changes in perception towards topics that they find most important when running a practice and were least taught during residency (Houlberg, 2008). These topics included time management, measuring patient outcomes, multidisciplinary coordination, and more. The results suggested that the residents indicated time management and multidisciplinary coordination to be the important topics leading into their practice (Houlberg, 2008). Generally, they perceived their respective programs to offer inadequate amount of teaching and training in these topics, suggesting a change in the curriculum for greater education on practice management (Houlberg, 2008).

Moreover, in Campbell's thesis from the University of North Carolina at Chapel Hill, she aimed to investigate factors that influence orthodontic graduates' career decisions and their job satisfaction (Campbell, 2020). From the survey conducted nationally by distribution from the AAO Partners in Research, they find out that the dissatisfaction

towards their profession was not only from the decrease in practice income, but also from the lack of knowledge in practice management (Campbell, 2020). In addition, decreasing number of residents were feeling prepared to own a practice right after graduation not only because they cannot afford to build a practice, but also because they lack the knowledge and experience in business management. They indicated debt and business management to be significant stressors (Campbell, 2020).

## **2.4 Changes in Dental School Curriculum**

According to the article by Kassebaum et al. in 2004, survey of academic deans from North American dental schools revealed that they call for greater changes in the areas of incorporating community-based treatments and in increasing the use of technology in their learning (Kassebaum et al., 2004). Moreover, many schools aimed to allow dental students to start patient care early in their training (Kassebaum et al., 2004). They also looked into innovative ways to test students' competencies and embrace group-learning experiences into their curriculum. Among the ten components of dental education reform agenda, all of them directed towards increasing students' learning experiences and clinical proficiency (Kassebaum et al., 2004). With the expansion in the scope of dentistry, many dental schools face difficulty in preparing their students into well-rounded individuals who are not only clinically adept but also knowledgeable and proactive in research (Rafeek et al., 2003). With consistently evolving dental materials, treatment options, and advance in technology, many dental schools struggle to involve business management into their curriculum (Henzi et al., 2007).

## **2.5 Current Structure of Orthodontic Residency Curriculum**

Most of the orthodontic residency programs in the United States focuses on three main areas of study, including biomechanics of tooth movement, clinical skills, and critical thinking (Ghafari, 2020). Although results from previous studies indicate that there is a lack of practice management teaching in residency programs, besides one or two lectures from the guest speakers, it is not emphasized enough (Ghafari, 2020). Current changes occurring in the orthodontic curriculum consist of incorporation of advanced technologies, including intraoral scanners and cone-beam computed tomography for diagnosis, and blending of virtual and in-person learnings. In addition, greater emphasis is on appreciating and conducting research, practicing clinical skills, and thorough understanding of the effects of biomechanics, genetics, and environment on the occlusion and tooth movements. Majority of the orthodontic programs in U.S. are preparing the residents well with great focus on teaching clinical skills and new materials/technology in the market. As a result, in the study by Noble et al. in 2009 that surveyed orthodontic residents, more than half of the residents reported that they will be using temporary anchorage devices with self-ligating brackets (Noble et al., 2009). These results suggest that they have already formed their preference for the type of bracket system and treatment mechanics they want to use in their practice. Current orthodontic curriculum certainly allows the residents to experience vast amount of treatment options, materials, and technologies (Noble et al., 2009). Interestingly, in a study conducted by Allareddy et al., some of the defining characteristics of an exceptional orthodontic program include healthy mix of full-time faculty members and residents, at least 70 new case starts that consist of orthognathic surgery and patients with craniofacial anomalies, and more (Allareddy et al., 2019). How

well the programs prepare residents' future plans as an owner/associate/employee of a corporate does not seem to be an important criterion.

## **2.6 Financial Success in Orthodontics**

In a 1992 survey at Graduate Orthodontic Resident's Conference (GORP), 68% of the orthodontic residents reported that they chose orthodontics as their career due to financial stability (Coats et al. 2000). Nonetheless, an average second-year resident's educational debt was \$132,120, which hinders them from starting their own practice or remaining as academicians. According to Caplan, to build profitable orthodontic practices, the owner must run them as businesses with structured business plan with specific guidelines for financial costs and sources, staff considerations, case fees, marketing, and more (Caplan, 2014). Creating an organized business plan seems to be the foundation of a profitable orthodontic practice. Along with a business plan, personalities of the orthodontists may play a role in their financial success. In the study by Coats et al., they discovered that two thirds of the orthodontists they studied had choleric (powerful) and melancholy (perfect) personalities and shared similar principles, including viewing control of overhead as the key to success (Coats et al., 2000). According to a study that examines how males and females run their practices differently, the results indicated that males have more clearly defined financial success as they see themselves as the bread winners of the family and thus utilize consultants, incorporate new technologies, and continuously strive to improve their practices (Bode et al., 2012). Compared to the male orthodontists, female orthodontists view financial success as additional supporting role to their husbands and are more likely to be satisfied with where they stand with less ambition towards growing their practices. Another significant factor that affects financial success of an orthodontic practice

is office design (Bode et al., 2012). According to Varghese and Doshi, good design helps the orthodontists to effectively communicate and deliver their suggestions to the patients and increase the chance of their acceptance and start of the treatments (Varghese & Doshi, 2016). Moreover, online marketing plays a significant role in swaying patients' minds as they struggle to decide which practice to choose (Gupta et al., 2016). Keeping a well-organized website of the practice with high reviews, updated pictures, and descriptions of different services certainly help increase the orthodontist's credibility and portray one's passion towards growing his or her practice (Gupta et al., 2016).

## **2.7 Keys to Successful Business Management**

One of the key elements of successful dental practice is how people function and interact within the business (Eyster, 2019). Besides overhead and legal issues, what is happening within the collective unit of the business through the lead of the dentist seems to be an important consideration. This is based on the understanding that people perform to their fullest when the business leader considers interactions to be crucial in practice and when all members understand the shared goals of the business (Eyster, 2019). As staff satisfaction helps lead to a successful practice, it is no doubt that the relationships and clearly defined roles within the system with shared objective lead businesses to thrive (Eyster, 2019). Moreover, successful businesses start with business leaders who possess strong leadership and skills in business strategies, management, and effective decision-making (Eyster, 2019). In a survey distributed to more than 100 businesspeople in various fields of work, some of the keys to successful businesses included targeting specific groups, providing unique services, using advertising and marketing techniques, and implementing customer care programs (Ala, 1997). For instance, with the development of smart mobile

devices, they are now used for marketing purposes more than ever before (Plangger et al., 2015). People are consistently adding new applications into the market that help monitor current conditions of the teeth, easily set up appointments with the dentists, connect to local dentists in the community, or even offer educational videos of how to improve their oral hygiene (Plangger et al., 2015). Understanding what constitutes a successful business seems to be the first milestone to a thriving business.

## **CHAPTER 3**

### **AIMS OF THE INVESTIGATION**

This project, conducted to fulfill the requirements for a MS in Oral Biology from Temple University Graduate School, investigates any association between having taking practice management course during residency and financial success in the first 3 years of practice after graduation. In addition, the study examines further to see if there is any influence from other variables, such as help from family members or other people, such as attorneys, that could potentially affect the newly graduates' comfort level in managing a practice.

## **CHAPTER 4**

### **MATERIAL AND METHODS**

#### **4.1 Survey Design**

A survey instrument of 19 questions, consisting of multiple-choice questions and visual analog scales, was designed for the study and entered into SurveyMonkey, which is an online survey software that helps create and run professional online surveys (Figure 1). Questions 1-4 are written to obtain general profile of the respondents regarding their years in practice, practice modality, overhead, and income production in the first 3 years of practice after graduation closest to the whole number provided in the answer choices. Questions 5 and 6 reveal if the respondents received any help in starting their practice, either from their family members or from outside source, such as practice management consultant. Questions 7 and 8 are important in that they help differentiate who received graduate-registered practice management course during their residency and if they did, what kind of topics were covered. Questions 9-10 help grasp how long (in years) after graduation the orthodontists felt comfortable managing their practice and felt satisfied with their income. Questions 11-19 are visual analog questions to determine their comfort level in various topics of practice management (Figure 1).

## Practice Management in Orthodontics Survey

### 1. Years in Practice

- 0-5  
 6-10  
 11-15  
 15+

### 2. Your ownership of the practice was through

- Buying a practice  
 Starting a new practice from scratch

### 3. Practice Income in production in the 3rd year after graduation. Pick the closest number.

- 400K  
 600K  
 900K

### 4. What percent of your current production goes to overhead? Pick the closest number.

- 80%  
 65%  
 50%

### 9. How long did it take you after graduation to feel comfortable with the above topics (in years)? Pick the closest number.

- 5  
 10  
 15

### 10. How long did it take you since graduation to feel satisfied with your income (in years)? Pick the closest number.

- 5  
 10  
 15

### 11. For the following questions, please use the visual analog scale and slide the button.

How confident did you feel in managing a business at the time of graduation?

Not Confident  Very Confident

### 12. How confident did you feel about these following topics at the time of graduation? Overhead management

Not Confident  Very Confident

### 13. Legal Issues when buying/starting a practice

Not Confident  Very Confident

### 5. Did you receive any help in orthodontic business management after graduating from residency?

- Yes, from family/relatives  
 Yes, but from other people  
 No

### 6. If others helped your education in business, please rank them from most important to least important.

<input type="checkbox"/>	Attorney
<input type="checkbox"/>	Accountant
<input type="checkbox"/>	Practice broker
<input type="checkbox"/>	Architect
<input type="checkbox"/>	Practice management consultant

### 7. Did your orthodontic residency program offer business management course that included a syllabus with multiple lectures?

- Yes  
 No

### 8. If you have taken such course, please check all the topics that were covered. If no such course was provided in the curriculum, select 'N/A'.

- Purchasing (overhead)  
 Legal Issues  
 Marketing  
 Insurance  
 Retirement  
 Staff Management  
 Office Design  
 N/A

### 14. Understanding & Management of legal matters in practice

Not Confident  Very Confident

### 15. Marketing

Not Confident  Very Confident

### 16. Insurance

Not Confident  Very Confident

### 17. Retirement Strategy

Not Confident  Very Confident

### 18. Staff management

Not Confident  Very Confident

### 19. Office Design

Not Confident  Very Confident

**Figure 1: Online Survey Design.**

## **4.2 Survey Distribution**

Approval by Temple University Institutional Review Board (IRB) was sought before the commencement of the study to seek permission to survey the orthodontists. After IRB was approved, survey design was completed, and American Association of Orthodontists Partners in Research Program was contacted regarding surveys to be distributed. Once approved, they identified 704 members who fit the inclusion criteria. Inclusion criteria for the population included: 1) Active orthodontists registered in American Association of Orthodontists 2) Orthodontists who own solo practice, single or group practice, or dental group practice. Exclusion criteria for the population included: 1) General dentists/other specialty dentists 2) Orthodontists working as associates 3) Orthodontists working in University-Based dental/orthodontic practice, military-based dental/orthodontic practice/hybrid group practice.

The survey was distributed via email by AAO Partners in Research in August 2021. After initial distribution, another reminder email was sent 2 weeks after in an effort to increase the response rate. Survey was ongoing for 3 months and was closed in November 2021. Out of 704 members who received the survey, 142 members responded (20% response rate).

## **4.3 Patient Consent & Confidentiality**

Before starting the online survey, patient was provided with an informed consent form with details on what happens to their information if they agree to take part in the research and the risks and benefits of being part of the survey. Once the consent was obtained, the participant proceeded with the survey. Data were stored on the investigator's

secure servers and not downloaded to external devices, including laptops. The information, even if de-identified, will be destroyed at the expiration of the project.

#### **4.4 Statistical Analysis for Business Management and Financial Success**

In order to assess if there is any influence of having structured business management course during residency and financial income after graduation, Mann-Whitney test would be performed with  $p < 0.05$  as a significance level. Specifically, relationship between questions #3 and #10 will be evaluated against question #7. Any p-value less than 0.05 will indicate that taking the practice management course would have had either positive or negative influence on graduating orthodontists' income production at their 3<sup>rd</sup> year of practice and the amount of time it takes for them to feel satisfied with their income.

#### **4.5 Statistical Analysis for Assistance and Financial Success**

Aside from business management course, Kruskal-Wallis Test followed by Post-Hoc pairwise comparison and Polytomous Universal Model will be used to evaluate if having a support system outside of school after graduation could have had any impact on orthodontists' financial success during their early years of practice. Primarily, questions #3 and #10 will be evaluated against question #5 with significance level of 0.05. If p is less than 0.05, the result will suggest that help from others, such as family members, had a significant influence on obtaining financial success more quickly.

#### **4.6 Statistical Analysis for Level of Comfort in Business Management Topics**

The purpose of the visual analog questions toward the end of the survey (questions

#11-19) is to examine how comfortable the respondents felt towards various practice management topics at the time of their graduation. They include a wide variety of topics from overhead and legal issues when starting a practice to marketing and retirement strategy. To evaluate if there is any correlation between confidence level in these topics in relation to assistance from others (ex. Attorney), financial income, and presence of business management course during residency, multiple regression tests will be performed with a significance level of 0.05. Any p-value less than 0.05 will suggest that such variable has a significant correlation with the particular business management topic.

## **CHAPTER 5**

### **RESULTS**

#### **5.1 Profile of the Respondents**

Out of 704 orthodontists selected from AAO Partners in Research to have the surveys distributed, 142 responded, which leads to a response rate of 20%. Following are the results that reveal the profile of the population who responded to the survey regarding their years in practice, ownership, production, overhead, and whether their residency program offered a structured business management course or not (Table 1). Structured business management course was defined as a course that included a well-outlined syllabus with multiple lectures set aside from their clinical operations in order to exclude any programs that only offer one or two lectures on practice management. Majority of the respondents (47.18%) had an experience of practicing for more than 15 years while least number of the respondents had an experience ranging from 11-15 years, followed by equal percentage of respondents (19.01%) having 0-5 years or 6-10 years of practice experience.

More than half of the respondents (61.70%) reported that they started their ownership of practice by starting a new practice while others began by buying a practice. Practice income in production in the 3<sup>rd</sup> year after graduation for a majority of the respondents was closest to 400K while least number of people was closest to 900K. Regarding the percentage of total production that goes into overhead, 59.15% of the respondents reported that they have 50% of overhead while 38.03% responded that they spend 65% of their production on overhead.

Very few of the orthodontic programs offer business management courses as part of their curriculum with structured lectures and syllabus. In the survey conducted, more than half of the respondents (73.94%) reported that there was no business management course provided. From the respondents who recorded themselves as having had business education (26.06%), they reported that all topics from purchasing and legal issues to staff management and office design were covered in the course.

Table 1: *General Profile of the Respondents*

<b>Questions</b>	<b>Responses (in %) (N=142)</b>
Years in Practice	0-5: 19.01% 6-10: 19.01% 11-15: 14.79% 15+: 47.18%
Ownership of Practice	Buying a practice: 38.30% Starting a new practice from scratch: 61.70%
Practice income in 3 <sup>rd</sup> year	400K: 48.59% 600K: 46.48% 900K: 4.93%
% of production towards overhead	80%: 2.82% 65%: 38.03% 50%: 59.15%
Residency Program offer BM course	Yes: 26.06% No: 73.94%

## **5.2 Results for Business Management and Financial Success**

In order to assess if there is any significant relationship between having taken the business management course and financial success of the graduating orthodontists, two measures were considered: 1) Practice income in production in the 3<sup>rd</sup> year after graduation 2) How long it took since graduation to feel satisfied with their income (in years). The responses reveal that most of the respondents had 400K of income production in their 3<sup>rd</sup>

year after graduation and 76.06% of the respondents felt satisfied with their income within 5 years since they started to practice (Table 2).

To explore if there is any significant difference in financial income and amount of time it takes for the orthodontists to feel satisfied with their income in relation to availability of business management course during residency, Mann-Whitney Test was performed. According to the analysis, when access to business management course during residency and practice income in 3<sup>rd</sup> year after graduation were compared, p-value was 0.989 (sig.  $p < 0.05$ ). This suggests that there is no significant difference among orthodontists in their income production regardless of whether such information was taught during the residency or not (Table 3). Similarly, when offering of business management course was analyzed with the amount of time it takes for income satisfaction, p-value was 0.173, indicating that there is insignificant difference between orthodontists who had practice management course during residency and those who have not in terms of the number of years it takes for them to be pleased with their income.

Table 2: Responses on Variables for “Financial Success”

<b>Variables for “Financial Success”</b>	<b>Responses (in %) (N=142)</b>
Practice Income in 3 <sup>rd</sup> year after graduation	400K: 48.59% 600K: 46.48% 900K: 4.93%
Satisfied with income (years)	5: 76.06% 10: 23.24% 15: 0.70%

Table 3: *Mann-Whitney Test Result for BM vs. Financial income*

<b>Variables for “Financial Success”</b>	<b>Offered BM Course?</b>	<b>N (in count)</b>	<b>Mean Rank</b>	<b>Sig.</b>
<b>Practice income in production in 3<sup>rd</sup> year</b>	No	105	71.45	0.989*
	Yes	37	71.64	
<b>Satisfaction with income</b>	No	105	69.43	0.173
	Yes	37	77.36	

\*. Correlation is significant at 0.05 level.

### **5.3 Results for Assistance and Financial Success**

In addition to offering of business management course during residency, other variables were asked in the survey and assessed to examine if they have any correlation with financial success of the orthodontists during their early years of practice. These variables include any help from their family members/relatives or other people, including attorney, accountant, practice broker, and more. The responses revealed that 50.70% of the respondents received aid from their family/relatives, followed by 30.28% who recorded as having had assistance from other people, and only 19.01% indicated that they had no help from outside source (Table 4).

Furthermore, respondents were questioned to rank five options from most important to least important in getting help while setting up their practice. The choices included attorney, accountant, practice broker, architect, and practice management consultant. Interestingly, 59.12% of the respondents ranked attorney in their top of their list while 48.18% of them placed practice broker on the bottom of the list. As a result, overall ranking in order from the most important to least important was attorney, practice management consultant, accountant, practice broker, and architect.

Table 4: Responses for Help Received After Graduation

Questions	Responses (in %) (N=142)
<b>Help in Business Management</b>	Yes, from family/relatives: 50.70% Yes, but from other people: 30.28% No: 19.01%
<b>Others help: Ranking (5 options)</b>	Most ranked #1: Attorney – 59.12% Most ranked #2: Accountant – 32.85% Most ranked #3: Accountant – 56.20% Most ranked #4: Practice broker – 44.53% Most ranked #5: Practice broker – 48.18%  Overall ranking in order from most to least important: Attorney > Practice Management Consultant > Accountant > Practice broker > Architect

Firstly, to determine if there is any statistically significant difference among orthodontists in reaching their financial success after graduation depending on the level of aid provided after graduation, Independent-Samples Kruskal-Wallis test was performed. When getting help from others was compared to the amount of time it takes for the orthodontists to feel satisfied with their income, p-value was 0.925 with significance level of 0.050, suggesting that there is no association. However, interestingly, the test revealed that there is a significant difference in the level of income production based on the source of help received with a p-value of 0.012. As a result, Post Hoc pairwise comparison was carried out to investigate what source of help might have created such a difference.

Outcomes from the Post-Hoc analysis suggest that newly graduated orthodontists who received help from other people besides their family members had no significant difference in their income production in their 3<sup>rd</sup> year of practice compared to those who received support from their family with a p-value of 0.990 and significance level of 0.05. Moreover, when orthodontists who received no help from others were compared to those

who received help from people other than their family, there was insignificant difference in income production with p-value of 0.151. Nonetheless, there was a significant difference between those who received no help and those who did from their families with p-value of 0.009. Understandably, those who obtained help, particularly from their families, earned more than those who have not in their 3<sup>rd</sup> year of practice (Table 5).

Table 5: *Post-Hoc Pairwise Comparison for Help vs. Financial Income*

<b>Questions</b>	<b>Adjusted Significance</b>
<b>No Help vs. Help from others</b>	0.151*
<b>No Help vs. Help from families/relatives</b>	<b>0.009</b>
<b>Help from others vs. Help from families/relatives</b>	0.990

\*. Correlation is significant at 0.05 level.

#### **5.4 Results for Level of Comfort in Business Management Topics**

Several questions were asked in the survey in the form of multiple choice and visual analog questions to determine how confident the respondents felt towards various business management topics after graduation. Generally, when asked how long (in years) it took for the orthodontists to feel comfortable with practice management topics since the time of their graduation, 52.82% of the respondents felt 10 years while least percentage of respondents indicated as 15 years (0.70%). In addition, for the visual analog questions, the mean score for the level of confidence in various practice management topics, including overhead and legal issues, ranged from 39-46 (Table 6).

Table 6: Responses for Level of Comfort in Business Management Topics

Questions	Responses (N=142)
How long to feel comfortable in BM (in years)	5: 46.48% 10: 52.82% 15: 0.70%
Visual Analog Questions	Mean Score Responses (At the time of Graduation)
Confidence in managing business	39
Overhead Management	43
Legal issues when buying practice	42
Understanding legal matters	43
Marketing	43
Insurance	43
Retirement Strategy	40
Staff Management	45
Office Design	46

Using multiple regression analysis, comfort level in different business management topics (Q11-19) were analyzed in relation to ten variables with a significance level of 0.05 to determine if there exists any correlation, that being negative or positive, to other factors. Ten variables that each business management topic was compared to included: Architect (Q6), Accountant (Q6), Attorney (Q6), Practice Broker (Q6), Practice Management Consultant (Q6), Income Production (Q3), Help in Business Management (Q5), Offered Business Management Course (Q7), Comfortable with Business Management (Q9), and Satisfied with Income (Q10). Negative beta value indicates that there is an inverse relationship between the variables compared while positive value suggests that there exists a linear relationship. Interestingly, for the level of confidence at the time of graduation and in all business management topics, they presented significant negative correlation with the attorneys (beta: -2.270 to -7.336; p-value=0.000-0.030) and positive correlation with the offering of business management course during residency (beta: 2.876-13.164; p-

value=0.000-0.044). In addition, besides level of confidence at the time of graduation, confidence level in every business management topic showed negative correlation with practice brokers (beta: -1.931 to -5.987; p-value=0.000-0.041) (Table 7).

Furthermore, comfort level in several business management topics, including insurance, retirement strategy, staff management, and office design demonstrated unique patterns of correlation. Confidence level in insurance was negatively correlated with the number of years it takes to be satisfied with income (beta: -5.3888; p=0.045) and retirement strategy also showed negative correlation with income production in the 3<sup>rd</sup> year (beta: -2.533; p=0.033). Moreover, comfort level in staff management and office design were both negatively correlated with practice management consultant (beta: -3.153 to -3.772; p-value=0.011-0.020) (Table 7).

Table 7: Multiple Regression Analysis for BM topics

	VAS Q11	VAS Q12	VAS Q13	VAS Q14	VAS Q15	VAS Q16	VAS Q17	VAS Q18	VAS Q19
<b>Sig. (p&lt;0.05)</b>	0.000	0.002	0.000	0.000	0.002	0.000	0.000	0.000	0.001
<b>R<sup>2</sup></b>	0.247	0.180	0.334	0.303	0.184	0.258	0.230	0.211	0.197
<b>Architect</b>	*	*	*	*	*	*	*	*	*
<b>Attorney</b>	<b>B:</b> <b>-3.764</b> <b>Sig**:</b> <b>0.014</b>	<b>B:</b> <b>-4.263</b> <b>Sig:</b> <b>0.004</b>	<b>B:</b> <b>-5.881</b> <b>Sig:</b> <b>0.000</b>	<b>B:</b> <b>-7.336</b> <b>Sig:</b> <b>0.000</b>	<b>B:</b> <b>-3.770</b> <b>Sig:</b> <b>0.018</b>	<b>B:</b> <b>-6.179</b> <b>Sig:</b> <b>0.000</b>	<b>B:</b> <b>-2.270</b> <b>Sig:</b> <b>0.014</b>	<b>B:</b> <b>-4.421</b> <b>Sig:</b> <b>0.011</b>	<b>B:</b> <b>-3.428</b> <b>Sig:</b> <b>0.030</b>
<b>Account-ant</b>	B: 2.687 Sig: 0.105	B: 0.171 Sig: 0.914	B: 1.761 Sig: 0.263	B: -0.175 Sig: 0.917	B: -2.534 Sig: 0.145	B: -0.512 Sig: 0.769	B: 1.396 Sig: 0.161	B: -1.939 Sig: 0.301	B: -1.735 Sig: 0.310
<b>Practice Broker</b>	B: - 2.876 Sig: 0.055	<b>B:</b> <b>-3.243</b> <b>Sig:</b> <b>0.025</b>	<b>B:</b> <b>-2.920</b> <b>Sig:</b> <b>0.041</b>	<b>B:</b> <b>-4.208</b> <b>Sig:</b> <b>0.006</b>	<b>B:</b> <b>-5.987</b> <b>Sig:</b> <b>0.000</b>	<b>B:</b> <b>-3.980</b> <b>Sig:</b> <b>0.012</b>	<b>B:</b> <b>-1.931</b> <b>Sig:</b> <b>0.033</b>	<b>B:</b> <b>-6.685</b> <b>Sig:</b> <b>0.000</b>	<b>B:</b> <b>-5.883</b> <b>Sig:</b> <b>0.000</b>
<b>Practice Management Consultant</b>	B: 0.984 Sig: 0.448	B: -0.604 Sig: 0.629	B: -0.395 Sig: 0.748	B: -1.766 Sig: 0.183	B: -2.226 Sig: 0.104	B: -0.739 Sig: 0.589	B: 0.432 Sig: 0.580	<b>B:</b> <b>-3.772</b> <b>Sig:</b> <b>0.011</b>	<b>B:</b> <b>-3.153</b> <b>Sig:</b> <b>0.020</b>
<b>Income production in 3<sup>rd</sup> year</b>	B: 2.104 Sig: 0.224	B: -0.393 Sig: 0.813	B: 0.931 Sig: 0.571	B: 1.347 Sig: 0.445	B: -0.707 Sig: 0.697	B: -2.118 Sig: 0.246	<b>B:</b> <b>-2.533</b> <b>Sig:</b> <b>0.016</b>	B: -0.765 Sig: 0.696	B: -0.326 Sig: 0.855
<b>Help in BM</b>	B: -0.290 Sig: 0.833	B: -1.153 Sig: 0.385	B: 0.287 Sig: 0.826	B: 0.205 Sig: 0.883	B: 1.305 Sig: 0.366	B: 0.679 Sig: 0.640	B: 1.094 Sig: 0.188	B: 1.900 Sig: 0.224	B: 2.005 Sig: 0.160
<b>Offered BM course</b>	<b>B:</b> <b>8.106</b> <b>Sig:</b> <b>0.001</b>	<b>B:</b> <b>7.485</b> <b>Sig:</b> <b>0.001</b>	<b>B:</b> <b>13.164</b> <b>Sig:</b> <b>0.000</b>	<b>B:</b> <b>11.859</b> <b>Sig:</b> <b>0.000</b>	<b>B:</b> <b>7.638</b> <b>Sig:</b> <b>0.002</b>	<b>B:</b> <b>10.045</b> <b>Sig:</b> <b>0.000</b>	<b>B:</b> <b>2.876</b> <b>Sig:</b> <b>0.044</b>	<b>B:</b> <b>8.369</b> <b>Sig:</b> <b>0.002</b>	<b>B:</b> <b>6.906</b> <b>Sig:</b> <b>0.005</b>
<b>Comfortable with BM</b>	B: 2.736 Sig: 0.206	B: 1.565 Sig: 0.453	B: 1.826 Sig: 0.374	B: -0.317 Sig: 0.885	B: 2.761 Sig: 0.224	B: 1.326 Sig: 0.561	B: 0.013 Sig: 0.992	B: 3.680 Sig: 0.134	B: 4.382 Sig: 0.052
<b>Satisfied with Income</b>	B: -0.648 Sig: 0.798	B: -2.457 Sig: 0.315	B: -0.946 Sig: 0.694	B: -3.242 Sig: 0.210	B: -2.077 Sig: 0.434	<b>B:</b> <b>-5.388</b> <b>Sig:</b> <b>0.045</b>	B: -0.911 Sig: 0.550	B: 0.582 Sig: 0.839	B: -0.132 Sig: 0.960

\*. Architect was excluded due to multicollinearity.

\*\* . Correlation is significant at 0.05 level.

## **CHAPTER 6**

### **DISCUSSION**

With rapidly changing dental practice pattern from dentist-owned practices to development of dental service organizations (DSOs), it is important more than ever to be prepared with solid practice management and leadership skills to be able to work effectively after graduation with less stress (Han et al., 2018). According to 2017 Orthodontic Workforce report, 78% of the recent dental graduates reported that they are considering full-time associate positions in orthodontist-owned single or group practices during their search for employment (American Association of Orthodontists, 2018). Nonetheless, when they were questioned on their long-term career plan, 84% of the respondents considered orthodontist-owned single practice as their most preferred practice modality (American Association of Orthodontists, 2018). The difference between their reality and actual desire comes down to challenges they face during their transition phase from residency to workforce, particularly with their lack of knowledge and experience in practice management alongside with student debt. This lack of knowledge and experience results from orthodontic curriculum that highly focuses on clinical experience while de-emphasizing practice management (Sinclair & Grady, 2001). This occurrence can also be confirmed in this study as around 73% of the respondents reported that their residency program did not offer structured business management course and around 53% reported that it took them close to 10 years to become comfortable with managing businesses.

Previous literatures call for a change in the orthodontic curriculum to include structured practice management course that consists of various seminars and projects with

office rotations in order to help boost graduating orthodontists' confidence in getting into the business side of the field (Sinclair & Grady, 2001). These recommendations are generally based on annual survey reports of graduating residents reporting lack of confidence in owning their practice right after graduation that runs in parallel to their need to start as associates for a few years in the beginning to become more comfortable with patient interaction and various aspects of business management before considering opening their own practices. Hence, this survey-based study is aimed to investigate whether offering business management course during residency would significantly help graduating orthodontists achieve financial success more quickly than those who have not. Financial success is measured by income production in the 3<sup>rd</sup> year of practice and the amount of time it takes for them to feel satisfied with their income. In addition to any correlation between business management course and financial matters, other factors such as help from family members or others are also considered.

### **6.1 Correlation between Business Management and Financial Success**

Keys to successful business environment rely on various factors, including management practices, quality of the services, marketing/advertising, implementation of customer care programs, reduction of cost, and more (Ala, 1997). In order to allow comparison of practices according to their net come in 2015 JCO Orthodontic Practice Study, respondents were divided into high, moderate, or low net income groups depending on the range of their net income. Interestingly, compared to the low net income groups, high income groups implemented management methods such as taking measurement of staff productivity and performing in-depth analysis of practice activity with monthly written reports, in order to consistently monitor and improve the efficiency of the practice.

In addition, high net income practices were significantly more likely to use entertainment for the patients and more likely to have on-time appointments and on-time case finishing which all lead to reduced overhead overall. All of these factors that lead to highly successful orthodontic offices are discussed and taught in residency programs that offer structured business management courses.

The results from this study, however, revealed there is no significant difference in financial success among the graduating orthodontists regardless of whether business education was offered during residency or not. Likewise, availability of business education in orthodontic curriculum does not affect how quickly orthodontists feel satisfied with their income. In essence, orthodontists who had business management course during residency and those who have not had no significant difference in their income production and level of satisfaction towards their income. This validates the point made from previous literature that money cannot buy happiness as 85% of the orthodontists who responded to the survey indicated that they remain in the field for reasons other than just money (Hughes et al., 1996). According to Hughes et al., majority of the respondents were displeased with increased overhead due to complex inventory, inefficient staffing, or ineffective computer use. Nonetheless, most of the orthodontists were still very satisfied with the field they were in and enjoyed the work and service that they offered to the patients. As a result, knowledge in business management during residency program course does not seem to have a significant impact on neither the orthodontists' satisfaction with their income nor their income production in the 3<sup>rd</sup> year of their practice. This is an interesting finding as it suggests that although there are only few programs that offer business education seminars in orthodontic residency programs across the United States, there is no need for a change.

Although survey of 369 orthodontic residents in 2018 indicate that 46% of the respondents are planning on working as employees in orthodontic private practice and only 9% are planning to start their own practice, the issue seems to come less from their lack of confidence in managing practice but more from their increased student debt (Stoker et al., 2020). Interestingly, in a study that analyzed the factors that influence quality of life of orthodontists graduated between 1993 and 2006 from a public university in Colombia, the results suggest that the positive predictors were permanent contract, teaching/research activities, monthly income, and resting days per week while negative predictors were low social support, mental health, and rent housing. Accordingly, although financial success may be an important part of the lives of orthodontists, there seem to be other variables that make the profession more enjoyable and satisfactory than just money alone (Munoz-Pino et al., 2020). Even in the most recently published interview study, although majority of the residents reported that thinking about their debt makes them feel very to extremely stressful, most residents and working orthodontists still hold high level of job satisfaction and would still recommend the field of orthodontics to other people (Worthington et al., 2022). This result suggests that regardless of their state of financial stability and in lack of experience in certain aspects of the field, most residents and working orthodontists highly appreciate being in the profession and show high levels of satisfaction.

## **6.2 Correlation between Assistance and Financial Success**

Besides education from orthodontic curriculum, this study investigated whether assistance from others or family members drove any benefits in financial success of the graduating orthodontic residents. According to a survey conducted in 2006 from ADEA, 28% of the seniors reported that around 1 to 10% of their dental education was financed

through gifts or support from their family. Only 11.2% of the respondents reported that more than 50% of their education was supported by their family or relatives. Hence, nowadays, there is a decreasing trend in the number of dental school seniors receiving family/relative loans (Chmar et al., 2007). Similar trend is seen in orthodontists as more graduates are now seeking to work for corporate offices or DSOs and are less interested in long-term ownership due to considerable amount of student debt and less financial gifts and support from their families (Campbell, 2020). Many are now even delaying family plans and their primary focus is on becoming financially stable first before spending more time with families (American Association of Orthodontists, 2018). Compared to the past, due to incredible increase in tuition for all years of residency amounting to \$103,430, which is a 14.2% increase from 2012-13 academic year, there is no doubt that financial support from the families is decreasing over time (American Association of Orthodontists, 2018).

The results from this study indicate that there is a significant difference in financial success between orthodontists who received help from their family members and those who have not. In other words, those who received help from their family/relatives specifically, earned more than those who have not in their 3<sup>rd</sup> year of practice. Although the form of assistance is not specified, whether that being financial or physical, there is no significant difference between those who received help from their families and those who received help from others besides their families. It is understandable that graduating orthodontists would have been able to earn more at a quicker pace than those who received no support from their families since if the help was in the form of a financial gift, then they would have started off with much reduced student debt than those who did not have that opportunity. Another possible source of help could have been through connection. For

instance, if the parents of the graduating orthodontists had any association with the dental field or even owned orthodontic practices, then there is no doubt that those graduating orthodontists would have had a much easier time transitioning from residency to the workforce.

Undeniably, there is a growing number of females entering orthodontic profession as 50% of orthodontists under the age of 35 are represented by women (American Association of Orthodontists, 2018). For women, as work-life balance is very essential part of their career decision, they prefer to pursue associateships than running their own practice (Campbell, 2020). Although this particular survey does not indicate how many of the respondents were females or males, for female orthodontists, help from families/relatives physically with raising their children, for instance, would have taken a huge burden off from their mental stress (Morgan et al., 2022). This could have in turn allowed them to earn more and more easily become satisfied with their income than those who had no support from their families. Subsequently, regardless of whether the form of assistance was through physical, mental, or financial, those who received help from family members had significant difference in their income at the 3<sup>rd</sup> year of their practice from those who did not.

### **6.3 Correlation in Level of Comfort in Business Management Topics**

According to a study conducted by University of California, Los Angeles, on residents from twelve post-doctoral training programs in 2005, they believed that inadequate attention is being devoted to practice and patient management strategies (Houlberg, 2008). In another study from University of West Indies, UWI dental alumni

from 1994 to 2002 reported that they felt least competent in performing clinical research and in dealing with practice management issues at the time of their graduation (Rafeek et al., 2004). Certainly, these studies demonstrate that many dental and post-doctoral residents feel uncomfortable with practice management at the time of their graduation.

The result of this study is consistent with what was emphasized in previous literatures as when the respondents were asked how confident they felt in managing a business at the time of graduation, the mean score on the visual analog scale was 39 out of 100, which was the lowest mean score among 9 visual analog questions included in the survey. Although there was no significant difference in financial success between orthodontists who had business management course during residency and those who have not, offering of business management did have a significant impact on orthodontists' comfort level at the time of graduation. Based on multiple regression analyses, for the level of confidence at the time of graduation for all 8 of the business management topics listed, they had offering of business management as a significant positive predictor. What this means is that if the orthodontists had business management course offered during residency, they were more likely to feel confident at the time of graduation and feel more comfortable with topics related to business management. There exists a positive correlation between access to business education and how prepared the orthodontists felt towards managing a business at the time of graduation. This makes sense as the more knowledge one has on a certain topic, the more comfortable one will feel when approaching. On the other hand, there was significant inverse correlation between attorneys and how comfortable orthodontists felt toward various practice management topics. In other words, it is likely that the more the orthodontists felt incompetent about managing their businesses,

the more they were seeking for help from the attorneys. Most of the lawsuits from the patients' end are on either exacerbation of periodontal disease or orthodontists' lack of communication with parents and patients on risks and benefits of the treatment plan (Franklin, 2002). From the defense attorney's perspective, in order to most effectively avoid or defend a lawsuit, orthodontists are encouraged to keep good records (initial, progress, and final) and get in the habit of writing conversations in notes and to obtain written and signed informed consent to make sure both parties of the situation are on the same page (Speidel & Jerrold, 2004). As a result, it is understandable that the more the orthodontists feel incompetent in handling legal issues related to malpractice or in buying/starting a practice, they are more likely to hire attorneys to feel secured and prepared for unforeseen future issues that may arise in their practices. Similar to the attorneys, there existed an inverse correlation between the level of comfort in all business management topics and practice brokers. To put it another way, orthodontists who felt least knowledgeable on practice management were more likely to hire practice brokers. On the other hand, it could have been the other way around in which the more the orthodontists felt confident, the less likely they will be contacting practice brokers. Since the negative beta value only indicates that as the one variable goes up, the other variable goes down, it cannot demonstrate for certain in which direction the variables are going. Nonetheless, it makes sense that when selling one's practice, if the orthodontist is comfortable with determining fair market price and in drafting contracts, then he or she may not need to hire a practice broker. At that point, since the orthodontist may have been practicing and managing one's business for a long time, by the time the individual is ready to sell his practice, he may be comfortable with doing the process on his own and may not need a

practice broker. In a study by McNeill on 231 retired members of the Pacific Coast Society of Orthodontists, majority of the buyers (52%) were known personally by the seller before transition and 14.8% were identified through graduate orthodontic programs (McNeill, 1999). Hence, since most of the practices are transferred to people that they have known for a long time or built trust in, there is a high chance that there was low need for practice broker as the transferring process went smoothly with mutual agreements.

Other business management topics, including retirement strategy, staff management, and office design had unique correlations with other variables. To start off, level of competence in retirement strategy had inverse relationship with income production in the 3<sup>rd</sup> year after graduation. In another word, it is possible that that the more the orthodontists feel uncomfortable in planning their retirement, the less they will make in the 3<sup>rd</sup> year after graduation. This could be due to the fact that those who feel less knowledgeable in such matter may seek for more outside help and spend more money on hiring people, thus reducing the overall income production than those who do not especially in the beginning when everything is new. As the report in the past indicates, 70% of the retired orthodontists sought information and advice about retirement strategy from variety of sources, including attorney, accountant, financial advisor, and more (McNeill, 1999). Consequently, it is possible that the lack of knowledge in planning could have led to such inverse association.

Another intriguing factor to look at will be inverse relationship between staff management and practice management consultant. Interestingly, in a survey conducted in 2007 across the United States, when the orthodontists were asked to state their greatest issue of stress, staff management issue was on the top of the list (Bray, 2011). Orthodontists

often regretted for not hiring the staff members who fit the rest of their team members or for keeping staff members who did not integrate well with other people for a long time (Bray, 2011). Staff are integral part of the practice, and it is important that they conform to employment policies, HIPAA and OSHA regulations, and insurance policy requirements (Abdelkarim & Jerrold, 2015). The result of this study reveals that as the orthodontists feel less proficient in handling their staff, they are more likely to seek help from practice management consultant and vice versa. This relationship is expected as practice management consultants help improve the efficiency of the practice by training the staff members. Similar to staff management, the more the orthodontists feel that they are not skilled in office design, they are more likely to seek help from the practice management consultants. When starting a practice, office design is an important first step to branding the business as it is the easiest and the quickest way to convey to the patients one's mission, interests, and services (Varghese & Doshi, 2016). Not only is branding being expressed, but the office should also ensure to follow legal requirement from governmental agencies regarding x-ray equipment installations and privacy of patients' information must be met (Varghese & Doshi, 2016). Coming straight out from graduate school, it is understandable that if the orthodontists are starting their own practices from scratch, they are more likely to hire practice management consultants to discuss about branding and designing the office to suit the needs of the orthodontists, the staff, and the patients.

#### **6.4 Limitations and Recommendations for Future Studies**

One of the limitations of the study is the low sample size as although the study wanted to compare orthodontists who had business education during residency from those who have not, since very few programs offer such course, only 26% of the respondents had

that experience while the comparison group consisted of 73% of those who responded. Another limitation of the study is that in regard to assistance from family members or others, the question does not specify whether the help was in the form of physical or financial support. Financial support is also a broad term to use as it could come in the form of a loan that needs to be paid off or in the form of a gift that does not add on to the financial burden. Most importantly, since this study was based on a survey, it was inevitable to eliminate response bias. Although the survey was anonymous, for questions such as receiving help, they may have indicated as none as they might not have considered physical support as a form of help. Depending on one's definition of help, the answer could have been altered. Moreover, for questions that asked about income production the 3rd year after graduation, some respondents may have picked an inaccurate answer choice as they may have practiced for more than 15 years and may have forgotten or falsely remember how much they have potentially earned at that time. Thus, with all survey-based studies, response bias was unavoidable.

To our understanding, this is the first study to ever examine the relationship between offering of business management course and its effect on orthodontists' financial success and level of comfort in practice management after graduation. Although this study suggests that there are no differences in earning and amount of time it takes for them to feel pleased with their income among orthodontists regardless of whether such course was provided or not, it would be interesting to see if there are any influences on graduating orthodontists within the same residency program that recently included business management course into their curriculum. Within that same residency program, surveys could be distributed to both the alumni of the program who graduated the program when

there was no business education provided and those who graduated in the recent years to compare in what factors they differ in. This would ensure that there is equal number of people in both groups and within each group, since they all received same education in the same environment, the result of the effect of business management course may indeed be more accurate and representative.

## CHAPTER 7

### CONCLUSIONS

1. There is no significant difference in income production in the 3<sup>rd</sup> year between orthodontists who had business management course and those who have not during their residency.
2. There is no significant difference in how quickly orthodontists feel satisfied with their income regardless of whether the business management course was provided during the residency or not.
3. Orthodontists who received help, particularly from families/relatives, had a significant difference in income production in their 3<sup>rd</sup> year compared to those who received no help after graduation.
4. Offering of business management course during residency was a positive predictor for orthodontists' level of confidence at the time of graduation and level of competence in all topics related to business management course.
5. Attorney was a negative predictor for orthodontists' level of confidence at the time of graduation and level of competence in all topics related to business management course. Practice broker was a negative predictor for level of competence in all topics related to business management course
6. Retirement strategy was a negative predictor for income production in the 3<sup>rd</sup> year after graduation. Staff management and office design were negative predictors for practice management consultant.

7. Future studies should compare the before and after effect of implementing business management course within the same residency.

## REFERENCES CITED

- Abdelkarim, A., & Jerrold, L. (2015). Risk management strategies in orthodontics. part 2: Administrative considerations. *American Journal of Orthodontics and Dentofacial Orthopedics*, *148*(3), 511–514. <https://doi.org/10.1016/j.ajodo.2015.05.010>
- Ala, M. (1997). Keys to success in today's business environment, *22*(1), 24–29.
- Allareddy, V., Shin, K., Marshall, S. D., & Southard, T. E. (2019). Characteristics of an excellent orthodontic residency program. *American Journal of Orthodontics and Dentofacial Orthopedics*, *156*(4), 522–530. <https://doi.org/10.1016/j.ajodo.2018.10.026>
- American Association of Orthodontists. (2018). (rep.). *2017 Orthodontic Workforce Report*. Retrieved from [https://www.aaoinfo.org/sites/default/files/Orthodontic%20Workforce%20Report\\_April%202018.pdf](https://www.aaoinfo.org/sites/default/files/Orthodontic%20Workforce%20Report_April%202018.pdf).
- American Dental Association. (2019). (rep.). *How Big Are Dental Service Organizations?* Retrieved from [https://www.ada.org/-/media/project/ada-organization/ada/ada-org/files/resources/research/hpi/hpigraphic\\_0720\\_1.pdf?rev=832fb3ea006946bab3030d023c3694e7&hash=4707F315F0EB8FE5BFC77B45DDF1788A](https://www.ada.org/-/media/project/ada-organization/ada/ada-org/files/resources/research/hpi/hpigraphic_0720_1.pdf?rev=832fb3ea006946bab3030d023c3694e7&hash=4707F315F0EB8FE5BFC77B45DDF1788A).
- Barber, M., Wiesen, R., Arnold, S., Taichman, R. S., & Taichman, L. S. (2011). Perceptions of business skill development by graduates of the University of Michigan Dental School. *Journal of Dental Education*, *75*(4), 505–517. <https://doi.org/10.1002/j.0022-0337.2011.75.4.tb05074.x>
- Bode, L., Tuncay, O. C., Godel, J. H., & Merchán Tellez Marisol. (2012). *Exploratory study of Practice Management styles that yield material and personal rewards for male and female orthodontists* (thesis).
- Bray, R. (2011). The Top Ten Management Mistakes that Orthodontists make. *Seminars in Orthodontics*, *17*(4), 275–281. <https://doi.org/10.1053/j.sodo.2011.07.006>
- Bruner, M. (2004). The current crisis in Orthodontic Education: The residents' perspective. <https://doi.org/10.18297/etd/169>
- Campbell, B. C. (2020). *Understanding Factors Influencing Young Orthodontist Career Decisions* (thesis).
- Caplan, J. (2014). Develop and engage all your people for business success. *Strategic HR Review*, *13*(2), 75–80. <https://doi.org/10.1108/shr-11-2013-0105>

- Center for Health Workforce Studies. (2017). (rep.). *Trends in the Development of the Dental Service Organization Model: Implications for the Oral Health Workforce and Access to Services*.
- Chmar, J. E., Harlow, A. H., Weaver, R. G., & Valachovic, R. W. (2007). Annual ADEA survey of dental school seniors, 2006 graduating class. *Journal of Dental Education, 71*(9), 1228–1253. <https://doi.org/10.1002/j.0022-0337.2007.71.9.tb04389.x>
- Coats, M. J., Straja, S. R., Wiser, G., Heckman, H., Saavedra, W., & Tuncay, O. C. (2000). Defining characteristics of financially successful orthodontists. *American Journal of Orthodontics and Dentofacial Orthopedics, 118*(1), 18–23. <https://doi.org/10.1067/mod.2000.104818>
- Dunning, D. G., Davis, K. J., & Lange, B. M. (2018). Navigating career decisions in dental service organizations: Practical advice for students, residents, and educators. *Journal of Dental Education, 82*(12), 1273–1278. <https://doi.org/10.21815/jde.018.133>
- Eyster, W. (2019). *Successful Strategies for Increased Dental Practice Competitiveness* (thesis).
- Formicola, A. J., Bailit, H. L., Weintraub, J. A., Fried, J. L., & Polverini, P. J. (2018). Advancing Dental Education in the 21st century: Phase 2 report on Strategic Analysis and Recommendations. *Journal of Dental Education, 82*(10). <https://doi.org/10.21815/jde.018.109>
- Franklin, E. (2002). Why orthodontists get sued. *Seminars in Orthodontics, 8*(4), 210–215. <https://doi.org/10.1053/sodo.2002.127867>
- Ghafari, J. G. (2020). Ways and pathways of Global Orthodontic Postgraduate Education. *Seminars in Orthodontics, 26*(4), 188–198. <https://doi.org/10.1053/j.sodo.2020.11.003>
- Gupta, G., Miller, M. K., & Darda, M. (2016). The key to successful online marketing for an orthodontic practice: Mastering the plan. *Seminars in Orthodontics, 22*(4), 313–321. <https://doi.org/10.1053/j.sodo.2016.08.013>
- Han, J. Y., Paron, T., Huetter, M., Murdoch-Kinch, C. A., & Inglehart, M. R. (2018). Dental students' evaluations of Practice Management Education and interest in business-related training: Exploring attitudes towards DDS/DMD-MBA programs. *Journal of Dental Education, 82*(12), 1310–1319. <https://doi.org/10.21815/jde.018.139>

- Henzi, D., Davis, E., Jasinevicius, R., & Hendricson, W. (2007). In the students' own words: What are the strengths and weaknesses of the dental school curriculum? *Journal of Dental Education*, 71(5), 632–645. <https://doi.org/10.1002/j.0022-0337.2007.71.5.tb04320.x>
- Houlberg, B. J. (2008). Dental residents' perceptions of practice and patient management training during postgraduate education. *Journal of Dental Education*, 72(6), 643–652. <https://doi.org/10.1002/j.0022-0337.2008.72.6.tb04529.x>
- Hughes, D., Landay, M., Straja, S., & Tuncay, O. (1996). Application of a classical model of competitive business strategy to orthodontic practice. *American Journal of Orthodontics and Dentofacial Orthopedics*, 110(4), 405–409. [https://doi.org/10.1016/s0889-5406\(96\)70043-4](https://doi.org/10.1016/s0889-5406(96)70043-4)
- Kassebaum, D. K., Hendricson, W. D., Taft, T., & Haden, N. K. (2004). The dental curriculum at North American dental institutions in 2002-03: A survey of current structure, recent innovations, and planned changes. *Journal of Dental Education*, 68(9), 914–931. <https://doi.org/10.1002/j.0022-0337.2004.68.9.tb03840.x>
- McNeill, R. W. (1999). Retirement from orthodontics: Financial and psychosocial preparation and adaptation. *American Journal of Orthodontics and Dentofacial Orthopedics*, 115(3), 283–287. [https://doi.org/10.1016/s0889-5406\(99\)70330-6](https://doi.org/10.1016/s0889-5406(99)70330-6)
- Morgan, R., Tan, H.-L., Oveisi, N., Memmott, C., Korzuchowski, A., Hawkins, K., & Smith, J. (2022). Women Healthcare Workers' experiences during COVID-19 and other crises: A scoping review. *International Journal of Nursing Studies Advances*, 4, 100066. <https://doi.org/10.1016/j.ijnsa.2022.100066>
- Muñoz-Pino, N., Tibaná-Guisao, A. E., Cardona-Hincapié, J. D., Hurtado-Aristizábal, A., & Agudelo-Suárez, A. A. (2020). Factors associated to quality of life of Orthodontists graduated from a public university (1993-2016): A mixed-methods approach. *Dental Press Journal of Orthodontics*, 25(5). <https://doi.org/10.1590/2177-6709.25.5.23.e1-12.onl>
- Noble, J., Hechter, F. J., Karaiskos, N. E., Lekic, N., & Wiltshire, W. A. (2009). Future practice plans of orthodontic residents in the United States. *American Journal of Orthodontics and Dentofacial Orthopedics*, 135(3), 357–360. <https://doi.org/10.1016/j.ajodo.2008.09.024>
- Plangger, K., Bredican, J., Mills, A. J., & Armstrong, J. (2015). Smart Dental Practice: Capitalising on Smart Mobile Technology. *British Dental Journal*, 219(3), 135–138. <https://doi.org/10.1038/sj.bdj.2015.596>

- Rafeek, R. N., Marchan, S. M., Naidu, R. S., & Carrotte, P. V. (2004). Perceived competency at graduation among Dental Alumni of the University of the West Indies. *Journal of Dental Education*, 68(1), 81–88. <https://doi.org/10.1002/j.0022-0337.2004.68.1.tb03741.x>
- Sinclair, P. M., & Grady, E. M. (2001). Preparing to practice and manage: A program for educating orthodontic residents in practice management. *American Journal of Orthodontics and Dentofacial Orthopedics*, 120(1), 2–8. <https://doi.org/10.1067/mod.2001.115306>
- Speidel, T. M., & Jerrold, L. (2004). Record keeping to avoid or defend lawsuits: A defense attorney's perspective. *American Journal of Orthodontics and Dentofacial Orthopedics*, 125(6), 754–756. <https://doi.org/10.1016/j.ajodo.2004.03.011>
- Stoker, A. C., Schwarz, E., Doyle, L., & Iwasaki, L. R. (2020). Opinions, plans, and demographics of orthodontic residents: A follow-up study. *American Journal of Orthodontics and Dentofacial Orthopedics*, 157(6), 809–817. <https://doi.org/10.1016/j.ajodo.2020.01.014>
- Varghese, J., & Doshi, V. (2016). Orthodontic Office Design: Principles and practice. *Seminars in Orthodontics*, 22(4), 289–296. <https://doi.org/10.1053/j.sodo.2016.08.009>
- Weintraub, J. A. (2017). What should oral health professionals know in 2040: Executive summary. *Journal of Dental Education*, 81(8), 1024–1032. <https://doi.org/10.21815/jde.017.055>
- Worthington, C. C., Mihas, P., Bocklage, C., Frazier-Bowers, S. A., Lin, F.-C., Ko, C.-C., & Jacox, L. A. (2022). Educational debt and the gender gap: Understanding factors influencing orthodontists' career decisions. *American Journal of Orthodontics and Dentofacial Orthopedics*, 161(1). <https://doi.org/10.1016/j.ajodo.2020.10.027>