Philippine Christian University
Graduate School of Business and Management
Doctor of Philosophy in Development Administration

Towards an Enhanced Occupational Health and Safety Model for Dental Professionals

A Dissertation
Presented to the Faculty of the
Graduate School of Business and Management
Philippine Christian University

In Partial Fulfillment
of the Requirements for the Degree of
Doctor of Philosophy in Development Administration

Brian E. Esporlas
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TOWARDS AN ENHANCED OCCUPATIONAL HEALTH AND SAFETY MODEL FOR DENTAL PROFESSIONALS

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Abstract:
Objectives:

The objective of this study was to develop an occupational health and safety model for dental professionals based on level of awareness and degree of compliance.

Materials and Methods:

A total of 226 dental professionals that includes Dentist, Dental Laboratory Technician and Dental hygienist from the 3 selected economic growth centers of the Philippines, namely NCR, Cebu, and Davao, participated in the study. Survey forms to measure the respondents' level of awareness and degree of compliance to the Occupational health and safety standards (OHSS) key areas were given to the respondents during dental conventions.

Result:

Likert scale revealed 4.28 awareness score that means the respondents are moderately aware with OHSS standard and a 3.84 compliance score which means compliant to some extent only. Correlation result of 0.56 revealed a positive relationship between respondents' awareness and compliance, hence and increase in awareness warrant an increase to compliance. P value of 0.000 indicate significant difference between respondents' level of awareness and compliance. Regression equation revealed that 77.7% of the total OHSS practices is congruent of awareness and compliance. The remaining 22.3% may be due to other factors not included in this study.

Conclusion:

Awareness and compliance plays a vital role for the realization of a total occupational health and safety for dental professionals. A campaign to increase awareness of dental professionals to OHSS is a must to increase their degree of compliance.

Keywords: Awareness, compliance, Safety, Occupational Health

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APPROVAL SHEET

In Partial fulfilment of the requirements for the degree Doctor of Philosophy in Development Administration, this dissertation entitled, "**TOWARDS AN ENHANCED OCCUPATIONAL HEALTH AND SAFETY MODEL FOR DENTAL PROFESSIONALS"** was prepared and submitted to the graduate school of the Philippine Christian University, Taft Avenue, Manila by **ESPORLAS, BRIAN E.** It has been examined and hereby recommended for acceptance and approval.

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ENDORSEMENT

In partial fulfilment of the requirements for graduation leading to the degree in Doctor of Philosophy in Development Administration, this dissertation entitled,

Towards an Enhanced Occupational Health and Safety Model for Dental Professionals

has been prepared and submitted by **BRIAN E. ESPORLAS**. The acceptance of which is hereby endorsed.

MA. BELEN PASCUAL, Ph.D.
Adviser

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B.E.E

TABLE OF CONTENTS

List of Tables…… ix

List of Figures…….. xvi

Chapter

1. The Problem and its Backgroud

Introduction / Background……..…….. 1

Setting of the Study……..…….....……..... 4

Theoretical Framework…….....……..…... 5

Conceptual Framework……....……..….5

Statement of the Problem……...7

Hypotheses……..……..…...…..8

Significance of the Study…….……. 8

Scope, and Limitations of the Study……..…….……9

Definition of Terms……...…….…….....….10

2. Review of Related Literature and Studies

The Risk……..……...……..12

Malpractice……..……...……..13

Safe Workplace……..……..……...……...14

Ergonomic and Musckuloskeletal Disorder……...…….. 17

Waste Management ……..……26

Stress Management ……………………………………………………………… 33

Infection Control ………………………………………………………………36

Fire Hazard ………………………………………………………………… 40

Equipment Maintenance …………………………………………………… 41

Employees' Protection ……………………………………………………… 42

Supervision of the Professionals……………………………………………46

Synthesis……………………………………………………………………47

3. Methods and Procedure

Method of research ………………………………………………………… 48

Data Gathering Instruments Used………………………………………… 49

Validation of the Instruments Used ……………………………………………49

Data Gathering Procedure……………………………………………………… 50

Statistical Treatment of Data………………………………………………… 50

4. Presentation, Analysis and Interpretation of Data

1. Demographic profile of the respondents ……………………………………54
2. Level of awareness of respondents' on occupational

   health and safety standard…………………………………………………59
3. Degree of compliance of respondents' on occupational

   health and safety standard…………………………………………………62
4. Significant relationships that exist in the respondents'

   level of awareness and degree of compliance on

   occupational health and safety standard……………………………66

5. Significant differences that exist in the respondents'
level of awareness and degree of compliance on
occupational health and safety standard……………………………..…..67

6. Derived occupational Health and safety model
Dental professionals……………………………………………………..91

5. Summary, conclusion and recommendation

Summary of findings ……………………………....……………………………116

Conclusion……………………………………………………………………..…119

Recommendation ……………………………………………..………………..120

Bibliography………………………………..………………………..…...…....…..…122

Appendices

1 Curriculum Vitae……………..……………………….……………………..131

2 Tooth extraction armamentarium and waste ……...……..…………...….135

3 Waste management hierarchy ……………………………..……………..136

4 Collected oral specimen………………………………………………..137

5 Dental materials waste in dental laboratory ……………..……………138

6 Participation of dental professional to city fire drill ………..…………139

7 Equipment inside dental operatory ………………………………...…...140

8 Dental x-ray unit………………………...…………………………...141

8 Letter to the respondents ……………………………………………..……142

10 The questionnaires …………………………………….………….………143

11 Esporlas' model for Dental occupational health and safety ……151

Tables

1 Age distribution of the respondents ……54

2 Gender distribution of the respondents ……55

3 Distribution of respondents according to location ……55

4 Distribution of respondents according to profession ……56

5 Distribution of Respondents according to Profession per location……57

6 Perception of Importance of the respondents on the occupational health and safety key areas……58

7 Level of Awareness of the whole respondents on key areas of occupational health and safety ……59

8 Comparison of overall level of awareness on key areas of occupational health and safety of the three Dental professionals……61

9 Degree of compliance of all respondents on key areas of occupational health and safety……62

10 Comparison of overall level of compliance on key areas of occupational health and safety of the three dental professionals ……..64

11 Relationship of the respondents' Awareness to compliance on Occupational health and safety……..…..66

12 T-test of the respondents' awareness to compliance on occupational health and safety standard……...67

13 Overall relationship and difference of all the respodents' awareness to compliance on occupational health and safety standard according to age group ……..…….……..69

14 Correlation and T-test of the respondents' awareness to compliance on occupational health and safety standard according to gender ……..70

15 Correlation and T-test of the respondents' awareness to compliance on occupational health and safety standard according to location ……...…70

16 Significant difference on overall awareness on occupational health and safety standard according to respondents' age group ……..71

17 T-test to determine significant difference on overall awareness on occupational health and safety standard according to gender……71

18 Significant relationship and differences on the respondents' level of awareness and degree of compliance on OHSS general safety and health components……..72

19 Significant relationship and differences on the respondents' level of awareness and degree of compliance on OHSS workplace, exit and access component……...74

20 Significant relationship and differences on the respondents' level of awareness and degree of compliance on OHSS fire protection components……..76

21 Significant relationship and differences on the respondents' level of awareness and degree of compliance on OHSS machine, equipment and materials components……77

22 Significant relationship and differences on the respondents' level of awareness and degree of compliance on OHSS general work environment components……..…79

23 Significant relationship and differences on the respondents' level of awareness and degree of compliance on OHSS healthcare waste management components……..……81

24 Significant relationship and differences on the respondents' level of awareness and degree of compliance on OHSS employees' protection components……..……83

25 Anova on overall awareness on occupational health and safety standard according to the selected economic growth centers……..…..84

26 Duncal Multiple range of overall level of awareness on occupational health and safety among the selected economic growth centers ……84

27 Anova on overall awareness on occupational health and safety standard according to the different dental profession on each selected economic growth centers……...…….85

28 Duncan multiple range of overall level of awareness on occupational health and safety among dental professionals from NCR…….86

29 Analysis of variance on overall degree of aompliance on occupational health and safety standard according to respondents' age group ……..…...86

30 Duncan multiple range of overall degree of compliance on occupational health and safety based on the different age group……...……87

31 T-test to determine significant difference on the overall degree of compliance on occupational health and safety standard according to gender ……..……...87

32 Anova on overall degree of compliance on occupational health and safety standard according to the selected economic growth center …….88

33 Duncan multiple range of overall degree of compliance to occupational health and and safety among the selected economic growth center……88

34 Anova on overall degree of compliance on occupational health and safety standard according to the different professions on each selected economic growth center……..……..…89

35 Duncan Multiple range of overall degree of compliance on occupational health and safety among dental professionals from NCR ……..……..90

36 Duncan Multiple range of overall degree of compliance on occupational health and safety among dental professionals from Cebu ……...90

37 Duncan Multiple range of overall degree af compliance on occupational health and safety among dental professionals from Davao…….93

38 Multiple correlation result of components of the seven key areas on awareness.……92

39 Multiple correlation result of components of the seven key areas on compliance……94

40 Summary of multiple correlation of components of the seven key areas on congruency of awareness and compliance ……..…...96

41 Contingecy model on OHSS general safety and health ……101

42 Contingency model on OHSS workplace, exit and access components ……..…102

43 Contingency model on OHSS fire protection ……..……..……103

44 Contingency model on OHSS machine, equipment and materials ……104

45 contingency model on OHSS general work environment and housekeeping ……..….105

46 Contingency model on OHSS waste management components ……106

47 Contingency model of OHSS employees' protection ……..……107

Figures

1 Conceptual framework for an enhance OHSS For dental professionals ……..……6

2 Derived OHSS model for dental Professional ……107

3 Proposed algorithm of OHSS for dental professionals……114

CHAPTER I

The Problem and its Background

Introduction / Background

One of the major environmental problemS that the National and Local government, authorities of Department of Health, Department of Environment and National Resources and Department of Labor is the Occupational Health and Safety of every employees. Particularly the awareness and compliance of work force and the management to the set standard on Occupational Health and Safety management.

Public health and occupational hazard are two of the most controversial aspects of labor groups. Enough documented evidences from Health journals, book, other publications and media confirmed the negative impacts arising from non-compliance to Occupational health and safety standard. Health care establishment such as hospitals, medical, veterinarian, optical and dental clinics goal is to provide maximum and high standard of health services. However, this goal cannot be met, if Occupational Health and Safety Standard is not properly implemented.

Patient, community and healthcare provider's safety are critical dimensions of universal health coverage that remains as a complex challenge to health system worldwide. It was in 2004 when WHO launch the Patient Safety Program to intensify efforts to address challenges related to unsafe and poor quality care establishments.

While highly developed countries are implementing comprehensive Occupational health and safety standard for both health care workforces and general workforces, developing countries such as the Philippines is still facing issues on occupational health and safety due to insufficient financial resources, lack of awareness on how to properly draft, supervise, and implement Occupational Health and Safety Policies, which eventually lead the healthcare workforces to become unmindful to the occupational hazards and health risk around them.

Ambulatory Clinics such as Dental clinics are usually a small scale offices that renders health services to a few patients in a daily basis. Dental offices also has a limited

man power. Dental office management is still responsible for safeguarding the health, safety of its workforce and patients no matter how big or small it is.

According to the Department of Labor of United States, Dental professionals may be at risk for exposure to numerous workplace hazards. These hazards include, but are not limited to, the spectrum of blood-borne pathogens, pharmaceuticals and other chemical agents, human factors, ergonomic hazards, noise, vibration, and workplace violence.

Furthermore, United State Department of Labor (2015) stated that there are currently no specific Occupational Health and Safety Administration standards for dentistry. However, exposure to numerous biological, chemical, environmental, physical, and psychological workplace hazards that may apply to dentistry are addressed in specific standards for the general industry.

Dentist and clinic staff including patients, are the first on the list who may be affected of improper implementation of Occupational Health and Safety Standard. Classic examples of Occupational and Health hazard in a dental office are: poor dental waste management, poor or none at all evacuation plan in case of fire and earthquake, far proximity to hospital, and having no emergency escape way. Previous researchers revealed that majority of dental offices has a very low compliance on proper dental waste management set by the Department of Health.

Awareness and Compliance of dentists on Occupational Health and safety set play a major role in management and prevention to any life threatening events, natural or accident that may occur.

Committee on Health Literacy (2004) stated that the World Health Organization has included Health Literacy as a key factor in health promotion. Health literacy is of concern to people addressing worker health and safety, product labeling, environment health, patient right and responsibility, quality care, or access to information, insurance and services. Being aware of the standards and protocol is not enough. Awareness must come with compliance.

It is already established that awareness without compliance is still being illiterate. And being so, may cause grave threat to health and life of an individual or of the whole community.

As previously mentioned, non-compliant to Occupational Health and Safety Protocol can pose a threat to the life of every employees, guests, and clients of an organization. In the dental facilities, the common problem that might arise in terms of Occupational Health and safety are broken infection control, accident, trapped, tripping, fire, electricity outbreak and others.

The national government of the Philippines through the effectiveness of the Building Code of the Philippines, stated a policy to safeguard life, health, property and public welfare. Part of the occupational health and safety protocol being implemented is the compliance to the Fire Code of the Philippines.

Several OHSS incidence involving dental professional has been noted. The fire in Quezon City last December 2015 killed four dentist who were trapped inside their own clinic. The case of one dentist last May 2016 who died instantly because of air embolism when she accidentally puncture herself when her patient suddenly exhibit seizure. The case of dental hygienist in July 2016 who reported a needle pricking accident while she was cleaning the instruments of her dental employer was diagnosed with HIV last September 2016. All of these incidence can be prevented if Occupational health and safety standard are properly employed.

Currently, there is no specific Occupational health and safety policy for dental professionals. Acknowledging the urgency of this problem, a growing number of developed and developing countries, including the Philippines being prone to natural calamities and disasters, have taken up initial steps to address this need. These steps include establishment of regulatory bodies, formulation of national plan, exhibition of innovative approaches such as the National Disasters Risk Reduction Management. However, awareness and compliance of dental professional remains very inadequate in terms of Occupational Health and Safety Standard due to lack of policy and proper guidelines.

Setting of the Study

This study was conducted on the three selected economic growth centers of the Philippines. Economic Growth centers are local areas with a constant increasing economic capacity to produce goods and services compared to another. The selected three economic growth centers of the Philippines for this study are the following: National Capital Region, located in Luzon, Metro Cebu in Visayas region and Metro Davao located in Mindanao. These three growth centers are chosen because they have good numbers of registered dental professional who are actively practicing their profession and an active member of the Local and National Dental Association.

Czeriza Valencian (2016) stated that based on the Philippine Statistics Authority, National Capital Region (NCR) economy valued at 2.77 trillion in 2015 at a pace of 6.6 percent. Rosalinda Bautista (2016) of the Philippine Statistic Authority mentioned that NCR is no longer the fastest-growing region in the country, yet it is still accounted for the largest contribution to the country's gross domestic product (GDP) in 2015 at 7.59 trillion.

Rolando Dy in February 2016 wrote an article about the rise of Davao as economic growth center. Formerly known as Southern Mindanao composed of 5 provinces and Davao City as the premier city. It is the premier city because it is the main financial, education, medical and trade hub of the island. Dy reported also that Davao City GDP accounted for about 4 percent of the nation. Its regional GDP growth average over seven percent in 2012 and in 2013 Davao was recognized as the fastest growing city in 2014 at 9.4 percent.

Top Tens (2015) ranked Metro Cebu as the number 1 with the fastest growth of economy mainly due to richness in culture and tourism. It is known as the Queen City of the South, with an economic drivers such as Financial, education, medical, and agricultural development and tourism. Gerardo Sicat in 2014 stated that The region's gross regional product (GRP) grew 12.5 percent in 2010, 9.3 percent and 8.9 percent in 2012 and 2013, respectively.

The Philippine Dental Association 107th annual convention was held in SMX Convention center last May 2016. Sonia Matic (2016) stated that the 107th PDA convention

was attended with some 12,000 participants (dentist, dental technologist and dental hygienists) from all over the Philippines. Mark Villalobos (2016) informed the researcher that large percentage of Luzon delegation comes from NCR. Among the Visayas Region, it was the Cebu Dental Chapter who have the most numbered delegation. While from Mindanao, the Davao Dental Chapter has the biggest delegation. Therefore, these three selected economic growth centers are the most appropriate for this study.

Theoretical Framework

Similar to any project, Standardization of Occupational Health and Safety Protocol for Dental Professional is unique, complex, and requires a lot of effort with specific limitation such as time, resources and performance designed to meet goals and needs. This study is based on the theory proposed by Simon Salminem of Finnish Institute of Occupational Health.

Salminem's concept of work safety and health refers to all practical action taken at the shop floor level to promote the safety and health of the workers. His model proposes that actions on occupational health and safety must be theory driven because accident theories help to pinpoint dangerous factors in the company.

In this study, the researcher adopted Salminem's theory that awareness and compliance on safety and health plays a vital role in enhancement and promotion of Occupational health and Safety for Dental professionals

Conceptual Framework

Compliance of an individual to standards and prescribed policies are dependent to different factors such as awareness and enforcement. However, awareness is not enough for the individual to be compliant to a certain policy. A change of behavior and attitude for the best is necessary coupled with guidelines that will assist the public to conform with the prescribed standard.

This conceptual framework is presented with the independent, intervening and dependent variables. Independent variables includes demographic profile of the respondents, and the 7 key areas of occupational health and safety based on the building and fire code of the Philippines, Healthcare waste management set by the Department of Health, and Occupational safety and health standard amended by Department of Labor and Employment.

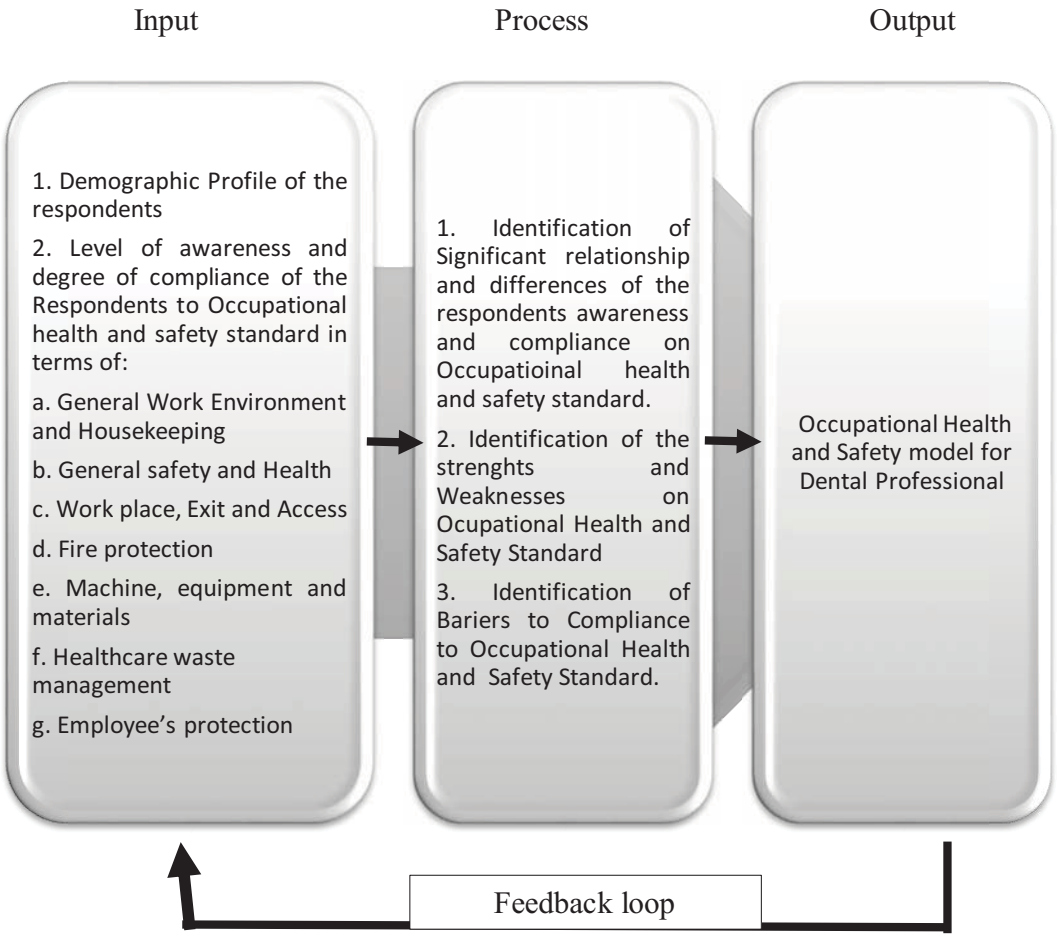

Figure 1

Conceptual Framework for Occupational Health and Safety Model for Dental Professionals.

Figure 1 presents the conceptual framework of this study. Following the concept of the IPO model, the framework shows how the Independent variables: demographic profile, the level of awareness and degree of compliance of the respondents lead to identification of the intervening variables: the strengths and weaknesses, the barriers to compliances and the significant commonalities and differences of the respondents to the Occupational Health and Safety Standard practices.

All these eventually result to the dependent variable which is the proposed enhanced model for Occupational health and safety standard for dental professional.

Statement of the Problems

The goal of this study was the development of Occupational Health and Safety Standard for dental professional base on their level of awareness and compliance.

Specifically, the study aimed to seek answers to the following questions:

1. What is the demographic profile of the respondents in terms of:
   a. Age,
   b. Gender,
   c. Profession, and
   d. Location of practice?
2. What is the level of awareness of the respondents' on occupational health and Safety standard in terms of the following variables:
   a. General Work Environment and Housekeeping,
   b. General safety and Health,
   c. Work place, Exit and Access,
   d. Fire protection,
   e. Machine, equipment and materials,
   f. Healthcare waste management, and
   g. Employee's protection?
3. What is the degree of compliance of the respondents' on occupational health and safety standard in terms of the following variables:

a. General Work Environment and Housekeeping,
b. General safety and Health,
c. Work place, Exit and Access,
d. Fire protection,
e. Machine, equipment and materials,
f. Healthcare waste management, and
g. Employee's protection?

4. What significant relationships exist in the respondents' level awareness and degree of compliance on Occupational Health and Safety Standard?
5. What significant differences exist in the respondents' awareness and compliance on Occupational Health and Safety Standard when they are grouped according to the profile of the variables?
6. Based on the findings, what enhanced Occupational Health and Safety Standard model can be proposed for dental professionals?

Hypothesis

This study tested the following hypotheses:

1. There are no significant relationships in the respondents' level of awareness and degree of compliance on the Occupational Health and Safety Standards.
2. There are no significant differences in the respondents' level of awareness and degree of compliance on Occupational Health and Safety Standards, when they are group according to age, gender, profession, and location of practice.

Significance of the Study

Since this study aim to promote awareness and compliance among dentist on the Occupational Health and Safety, the study will be beneficial to all practicing dentist, dental professors, dental students, and patients and guests.

To all practicing Filipino dental professionals. This study will be beneficial to them because the output of this investigation could give them an increase level of awareness on

the Occupational Health and Safety protocol, and a policy that will guide them on proper clinical set up to maintain high level of occupational health and safety compliance thus will aid Dentist to prevent any untoward incident that may pose danger to health or life of those who are inside their offices.

To all dental professors, who are teaching in dental school, this study will be beneficial to them because they will be more aware of the policy set by the National Government on Occupational Health and Safety protocol, and that they can properly guide and instruct their students on the clinical specification that needs to be addressed in terms of Occupational Health and Safety.

To the dental students, this study will be beneficial for the students taking Dentistry for as early in their career, they will be oriented on the proper dental waste handling, storage, transporting and disposal.

To the patients, this study will be beneficial for the patients and guests for they will be protected and safe at all times while inside the dental clinic premises.

To future researchers, this study can serve as a reference for future researchers who will attempt to perform a further study on occupational health and safety for dental professionals.

Scope and Limitations of the Study

The primary objective of this study was to determine the level of awareness and compliance of dental professionals on the Occupational Health and Safety Standard. The study focused on determining the relationship and differences that exist between awareness and compliance of the respondents on the General safety and Health, Workplace, Exits and access, Fire protection, Housekeeping and general work environment, Machines and equipment, Materials and Employee protection.

The study included dental professionals such as dentists and dental technologists operating their own dental offices and/or laboratory, and dental hygienist on active partnership with a registered dentist only.

The study did not compare the level of awareness and compliance between private, government employed, and hospital based dentist.

Definition of Terms

In Order to have a better understanding of this study, the following terms are defined operationally.

Awareness. It is the state of being informed about a certain concept.

Compliance. It is the willingness to follow or consent to another's wishes (Lexicon Encyclopedia dictionary, 1993)

Dentist. It is the person who has received a degree from an accredited school of dentistry and is licensed to practice dentistry by a state board of dental examiner (Jablonski Illustrated dental dictionary, N.D).

Dental hygienist. It is an oral health care professional authorized to provide clinical and therapeutic services under the supervision of a licensed dentist (Mosby's dictionary of Medicine, 8th ed).

Dental Laboratory Technician. It is the person who makes dental prosthesis and orthodontic appliances as prescribe by the dentist (Mosby's dictionary of Medicine, 8th ed).

Dental Professional. As use in this study, it pertains to dentist, dental hygienist and dental laboratory technician.

Environment. It is the surrounding, especially the material and spiritual influences which affect the growth development and existence of a living being (Lexicon Encyclopedia dictionary, 1993).

Hazard. It is the source of danger (Meriam – Webster)

Healthcare work force. It is the team responsible for delivering healthcare services.

Management. The body of those in positions of administrative authority (Lexicon Encyclopedia dictionary, 1993).

Occupational Health and Safety Standard (OHSS). It is the accepted practice to safeguard the properties, health and life of all members of an organization.

Safety. It is thequality or state of not presenting or involving risk or danger (Lexicon Encyclopedia dictionary, 1993).

Standard. It is the universal accepted norm.

CHAPTER 2

Review of Related Literature

This chapter discusses the literatures and studies related to the current study. This gives ideas on how the researcher was able to finish this study.

The Risks

Jamshid Ayatollahi et. al. (2012) stated that dental professionals are predisposed to a number of occupational hazards. They reported that Dentistry is considered by the practitioners and most of the public as extremely hazardous. Their study suggested that occupational hazard for dentist includes exposure to infections, percutaneous exposure incidents, dental materials, radiation, noise, musculoskeletal disorders, psychological problems, dermatitis, respiratory disorders and eye insults. On the statistics they presented percutaneous exposure incidents remain a main concern, as exposure to serious infectious agents is a virtual risk. They further stated that it is vital for dentist to remain constantly updated about new measures on how to deal with this occupational hazards.

Osazuwa-Peters N et. al (2013) reported that the prevalence of percutaneous injuries among medical and dental house officers in Nigeria was 56.9% while 1/3rd of all injuries are constituted as needle injuries. The study showed that a substantial number of medical and dental workers of Nigeria are exposed to occupational injuries to which they call for an adequate educational programs for safer work environment.

Dental Laboratory Technician faces their own occupational health and safety dilemma such as Silicosis. Silicosis is a disabling and incurable lung disease that frequently affects dental laboratory technician. It is caused by breathing in fine dust containing crystalline silica that causes damages that stop the body from using oxygen properly. Multiple study has linked crystalline silica to other diseases such as tuberculosis, kidney disease and lung cancer.

Dental laboratory technicians are predisposed to constant exposure to crystalline silica because most dental laboratory procedure are related to crystalline silica such as casting, sandblasting, and grinding porcelain.

Dental Hygienist are predispose exposure to all work related hazard of dentist. Because they have almost the same routine that of the dentist.

Currently in the Philippine set up, the dental curriculum includes Dental practice management, and in some school, infection control is also part of the curriculum. Dental practice management mostly deals with the patient management and a few pointers on the business aspect of dentistry. While infection control mainly tackles how to prevent infection and cross contamination within and outside dental office and dental laboratory. However, infection control is just a small part of occupational health and safety standard.

Malpractice

Throughout history, patients have entrusted their fates and lives to the services of their dentist. The community only consign the divine obligation of preservation of oral health to dental profession. Therefore, only the most qualified dental practitioner should participate in this profession.

Angeles (2010) stated that whenever a medical practitioner fails to meet the standards demanded of him by his profession, he may be held liable in action in court premised on such breach of duty. Such action is commonly known as medical malpractice. Furthermore, Angeles mention that malpractice is not limited to lack of skills or neglect to apply it, but is also applicable to negligence to protocol.

Safety of the workforce is highly correlated from the safety of the patient. Atty. Farolan (2016) stated that occupational health and safety may prevent any untoward incident that may cause harm to both Healthcare work forces and the patients.

The license to practice dental medicine can be revoked by the government any time if the holder is proven unfit to practice the profession. It is not just a right, but also a privilege. Malpractice can lead to revocation of license to practice dentistry. Malpractice is not only putting the life of the patient at risk but as well as the dental professionals.

A classic example of this is when the healthcare workforce failed to properly sterilized instruments using the prescribed method of sterilization, and using that instrument is a case of malpractice, and a violation to the occupational health and safety standard.

Malpractice is highly related to Occupational Health and Safety standard. OHSS will help prevent malpractice. An example of this was the case reported by Dr. Florento (2016) that her highspeed was not calibrated by her clinician. During the surgical procedure, the cover cap of the handpiece suddenly become loose and it was aspirated by the patient. It was fortunate that the cap goes directly to the stomach and not into the respiratory tract.

The case reported by Dr. Hicarte (2015), she was invited in a clinic to perform a specific procedure in a patient. She require the use of a cautery instrument. She plug it in to the nearest available electrical socket, turned it on and started using it in the patient. The moment she step in the pedal, she and the patient both received a mild electrical shock resulting to mild gingival abrasion to the patient. It was found out that the cautery unit must be plug in 110v socket and not in the regular 220v socket. These are forms of malpractice that resulted from violation of occupational health and safety standard. It includes protocol of calibration of instruments and instruction on how to use the equipment must be readily available to be followed, so that these events could be prevented.

Safe Workplace

Wilson (2015) stated that every business is concerned to some degree with protecting its valuable assets. Many spend millions of dollars to protect information, hardware or online properties from various threats. What some might be overlooking, however, is the physical safety of on-premise staff and customers, a concern that should be at the top of every company's list of priority.

During the earlier days of production industry, particularly in the factory industry the legal expression "assumption of risk" are often heard. This phrase means that the worker accepted all the customary risks associated with the occupation. It is also interesting to note

that any scar or stumps on any part of the worker's body acquired during work hours within the work place will often be referred as badge of honor.

During those days, safety was merely a function of Luck. Workers get hurt because they are unlucky. However, when the "careless worker" model was introduce, luck lost its role. Employers are providing trainings for the workers to be more sensitive of the dangers within the workplace, yet this approach assumed that the accident was due to workers carelessness.

With the careless worker model, many workers lost work time because of injuries. These injuries was not just due to the workers being careless, but it also has something to do with the hazardous set up of the work place. Managers of different level started to acknowledge that prevention of accidents and creating a safe environment for work is a responsibility of both workers and the management. Hence the start of the "shared responsibility" model. This model recognized the needs for the management and employees share responsibilities on prevention and reduction of accidents.

Over the last decade, due to the numerous natural calamities that make the workers life in dangers, there has been an increase concern about the environment coupled with a growing emphasis on health and safety in the workplace. Today, health and safety is consider as a minimum requirements for employers, that the human resource should ensure consistent enforcement of all safety and health rules within the organization.

Employer and employees has joint responsibility and rights under the provision of the occupational health and safety act. Employer are responsible to provide a workplace free from any recognized hazards, as they too, also have the rights to seek consultation to Occupational Health and Safety experts. As for the employees, they are expected to abide and comply with the set of rules and regulation the employers have enforced as part of occupational health and safety within the workplace.

Any untoward incident that might arise, will almost always a responsibility of the employer. However, the liability of the employers is somehow reduce because of the court

recognizing that employees play a vital role as well in prevention and reduction of any untoward incidents.

Most safety expert agreed that safety commitment begins with top management. It must be the management who will provide remedy to eliminate or minimize unsafe condition within the workplace. Policies must be drafted, rules and regulation must be cascaded to all members of the organization, from the top management to the rank and files. Direct supervisors, as part of the management team, must take safety seriously as they are consider as the critical link in the chain of occupational health and safety.

In a small industry like ambulatory clinics such as Dental offices, veterinary clinics, optometry clinics, occupational health and safety issues is not as big as the one in a big industries such as power plant and factories. Nonetheless, management of these small ambulatory clinics are still responsible to safeguard the life, health of its workforce, clients, and guests.

The number one reason of increasing incident of accidents in a work place is the negligence of the management on the Occupational Health and safety standard. Building and offices are now regulated by the Building code of the Philippines. It is stated in the Building code to safeguard life, property, public welfare consistent with the principle of sound environment. Therefore, the building code is the primary source of information for Occupational Health and safety.

Fried and Kohn (2007) stated that companies, addressing safety, health and environment issues may mean more than good business practice and survival. The same concept is applied to public health, an organization that address safety, health and environment issue may mean healthier community which will lead to efficiency and eventually lead to better performance.

Furthermore, Friend and Kohn (2007) also stated that Occupational Safety and Health act was the culmination of centuries of governmental response to occupational safety and health problem, incident rates and number of fatalities have dramatically declined since 1970 and this declined appears to be a result of legislation.

However, lawmaking is not enough to create a safe working environment, rather, it only serves as baseline for institutions that might otherwise have a safety and health program at all. Generally, compliance requirements have encourage a safer and healthier work place and helped assist otherwise unsafe companies towards protecting the health and safety of work force.

Ergonomic and Musckuloskeletal Disorder

Public Health is a prime concern of any organization. It pertains to the preservation and protection of the overall health of a community. Any health deteriorating factors can lead to worker low output and low productivity.

Bernard Turnlock (2004) stated in his book Public health that the ability to identify risk factors and pathways for causation is essential for rational public health decisions and actions to address important health problems in a population. This statement is directly involve with musculoskeletal disorder prevention and management. Clinic manager/owner is also a public health administrator. They must be able to identify MSDs risk factors that affect their staff and most importantly their patients.

Ergonomics can help eliminate wasteful activities in multiple ways. It helps promote efficiency and on top of this is the prevention of MSDs. But ergonomic designing and policy drafting requires strategic management. Dan Macleod (2006) pointed out in his book The Ergonomic Kit that the principle of ergonomics apply as much to promote efficiency as they do to prevent injuries. He also noted that risk factors for MSDs is also a risk factors for inefficiency.

The same thing must be considered in a dental office. Inefficiency in dental procedure due to poor clinical ergonomics is also a risk factors for MSDs. Ergonomics is an essential ingredient for other methods of refining workplace operation. The point of ergonomics is to maximize human performance while decreasing or preventing injuries and or by increasing capabilities over a better scheme.

In the book of Thomas Wheelen and David Hunger, Strategic Management and Business Policy (2000), organizations base their action on a collected data. Therefore, workplace set up must be designed by the administration base on the nature of work being done in a specific area. With this in mind, ergonomics must be part of the strategy.

Musculoskeletal disorder is consider as one of the leading cost of lost work days. Also, this can be one of the reasons of dental health professional skipping a clinical duty. Bad habit and bad posture in the work place can trigger MSDs development. However, poor ergonomic design in a workplace is also a contributory factor to MSDs. According to Chelsea (2001), evaluation and design of jobs for control of cumulative trauma disorders is an ergonomic interventions to prevent musculosketal injuries in industry.

Physical therapist observed three ways how working with an awkward posture reduce efficiency. These are, reduce strength, less accuracy and faster fatigue. Dental procedures requires accuracy, a simple mistake can lead to injuring a patient. Dental procedure also sometimes takes time to be completed. It is very important that the dental professional work in a good posture, otherwise dental professional will tire much more easily, which will also slows him down with whatever procedure he is doing.

Being aware of what is MSDs and ergonomics is all about is not enough if a person will not adopt the concepts that will prevent MSDs and the concept of ergonomics. Health Literacy book of Institute of Medicine of the National Academies (2004) identifies health literacy as an important component of health communication, medical product safety and oral health. Health literacy is the actual awareness that affect compliance. WHO (2000) concluded that health literacy is a key factor in health promotion. However, literacy and awareness is not the only factor to secure compliance. One should also consider Motivation to secure compliance.

Ergonomics is not just for prevention of MSDs, not just for increasing efficiency but to promote occupational health and safety within the workplace as well. Occupational Health and Safety is a joint responsibility of all members of an organization, top management down to the rank and file group. In a dental office, Occupational Health and Safety is important. It is a responsibility of the owner, dentist, and all the members of the clinic workforce.

A number of dentists lost clinical working time because of injuries. These injuries was not just due to the dentist being careless, but it also has something to do with the hazardous set up of the Clinical infirmary.

The Shared Responsibility model can be directly applied to the ergonomics, occupational health and safety in a dental offices. This will ensure cooperation of the private dental providers and local government units and building administrators to where the dental office is located.

Cooper et. a. (1978) stated that dentisty as an occupation which is potentially stressfull that could lead to stress related coronary heart disease. Extended working hours causes a significant decrease in effectivity and efficiency at the workplace. Dentist are almost always expose to stressful and extended working hours which may compromise their performance on giving the utmost care to the patient, which in the end, may compromise the health of the patient. Due to the long and extreme working hours of dentist which is sometimes coupled with poor working position, dentist are prone to fatigue accumulation and musculoskeletal disorder. Roach et. al. (2012) study suggest that it is the number of recovery days, per se, rather than the amount of sleep per day that is important for prevention of accumulating fatigue.

According to Jahfar, Tharim and Khamar (2011) Ergonomics is a broad science with wide variety of working conditions that can affect worker's comfort and health, including factors such as lighting, noise, temperature, vibration, heavy lifting, repetitive motion, workstation design, tool design, machine design, chair design and footwear and others. Job design also gives a great impact with such factors such as shift work, breaks, and meal schedules.

These factors can result in injuries or related problems involving the tendons, muscles, or nerves which most of the problems may develop to musculosketal disorders (MSDs). Jhafar, Tharim, and Khamar (2011) study also stated that significant poor ergonomics risk factors or conditions may increase the likelihood of injury and further develop to MSDs. The risk factors include working in awkward posture, vibration and force which may come from gripping, lifting, pushing or pulling. Repetition which involves in

doing a task that uses the same muscles over and over with little chance for recovery or working in extreme temperature condition either extremely cold and extremely hot also are the main risk factors. Working in uncomfortable static position or contact stress of muscles and tendon also will increase the likelihood of injury

Musculoskeletal disorders is a disorder involving nerves, tendons and muscles. The common type of MSDs is the work related MSDs. Work related MSDs is one of the leading causes of lost workday injury and illness. In case of a student, particularly the dental clinicians, can also be exposed to risk factors at the clinical infirmary, such as lifting heavy items, bending, reaching overhead, pushing and pulling heavy loads, working in an awkward body postures, performing same procedure or task repetitively. Continues exposure to these known predisposing factors for MSDs upsurges the clinicians risk of developing an injury.

Bureau of Labor statistics in the United States in 2011 narrated their findings on which industries are commonly affected by MSDs. On top of the list is the workers from the health care force. Health care work force members are constantly exposed to MSDs risk factors. It is a good evidence allied health professioal such as dentist must be properly informed on what is MSDs all about.

Amstrong and Lifshita (1897) stated that posture is the position of a part of the body relative to an adjacent part as measured by the angle of the joint connecting them. Postural stress is assuming an extreme posture at or near the normal range of motion. Posture is one of the most frequently cited occupational risk factors.

According to the United States Department of Labor (2011), employers are responsible for providing a safe and healthful workplace for their worker. This concept is also applicable to dental offices. The dental office management is responsible for providing a safe and healthful workplace for their staff and patients as well.

In dental offices, the number and severity of MSDs resulting from physical overexertion, as well as their accompanying cost can be significantly lessen by adopting ergonomic principles.

Chris Adam (2014) stated that ergonomics is about making things better, that ergonomic makes for a happier, and a healthier user. Adam believes that the core benefit of

ergonomics is an increase in the user's or worker's comfort. Ergonomics is definitely a factor that would reduce the incidence of MSDs. Especially, if Ergonomics and MSDs will be presented to health care work force and allied health provider such as the dentist early in their career.

Saving time is also a result of good ergonomics. It shortens the length of time to accomplish a goal. It is the goal of ergonomics to make things more efficient. This is another advantage for the dental clinician. Applying ergonomics will help them finish their task earlier. However, the facilities intended for dentist or dental office staff must also be designed in such a way that it will promote comfort and efficiency.

Although the causes of any particular case of a MSD are exceedingly difficult to identify with complete accuracy, certain risk factors are typically discussed in the field of ergonomic studies. Musculoskeletal disorder is a condition or disorder that involves the muscles, nerves, tendons, ligaments, joints, cartilage, or spinal discs. These disorders are not typically the result of a distinctive, singular event, but are more gradual in their development. Thus, MSDs are cumulative type injuries. It is essential to understand just what a risk factor is, or rather is not.

William J.,Wiehagen and Fred C.T.,(2004) stated that a risk factor itself is not necessarily a causation factor for any particular MSD. Many times it is not simply the presence of a risk factor, but the degree to which the risk factor is expressed that may lead to MSD. Similarly, to the extent MSD case is attributable to a risk factor, often it will be a combination of multiple risk factors, rather than any single factor, which contributes to or causes an MSD.

Warren N (N.D) stated in his a study of combined biomechanical and psychosocial risk factors stated that biomechanical and psychosocial exposures have independent and additive associations with the wide variety of outcomes, often of similar magnitude. Biomechanical exposures tend to be associated with negative outcomes in identifiable body areas, whereas job stress had fewer identifiable associations with outcomes by body area.

According to the Work stress and musculoskeletal disorder etiology: The relative roles of psychosocial and physical risk factors by Warren N, Work stress is one of the results

of this stressor combination and is part of the physiological pathway to MSDs and a wide range of other occupational diseases. Prevention efforts geared to a single or single class of exposure may be only partly effective, ineffective, or even counter productive. The most effective control strategies are rooted in on-going, participatory ergonomics programs, incorporating a joint labor/management ergonomic team; this blueprint for intervention necessarily addresses the roots of both physical and psychosocial work stress experienced by workers.

Ayatollahi et al. stated that Strained posture at work disturbs the musculoskeletal alignment and leads to stooped spine. The stooped posture also involved certain groups of muscles and joints. This may lead to diseases of the musculoskeletal system. Continuous educating and appropriate intervention studies are needed to reduce the complication of these hazards. So, it is important for dentists to remain constantly up-to-date about measures on how to deal with newer strategies and dental materials, and implicates the need for special medical care for this professional group.

In the Epidemiology of work related neck and upper limb problems: psychosocial and personal risk factors (part I) and effective interventions from a bio behavioural perspective (part II) of Bongers, Ijmker S, van den Heuvel S, Blatter BM, shared few randomised or non randomised controlled trials that have been carried out to evaluate the effectiveness of individual or organisational interventions to improve work related psychosocial factors. Very few have reported on the preventive effect for work related neck and upper limb symptoms. Therefore, there is a great need for additional high quality trials before any conclusions on effectiveness of bio-behavioural interventions for reduction of neck and upper limb problems and return to work after these symptoms can be made. From the low back pain intervention research can be learned that interventions should best be targeted to both the worker and the

organisation and that interventions will only be successful when all stakeholders are involved.

In The impact of workplace risk factors on the occurrence of neck and upper limb pain: a general population study by Sim J, Lacey RJ, Lewis M, found out that Neck and upper limb pain is associated with both physical and psychosocial factors in the work environment. Inferences of cause-and-effect from cross-sectional studies must be made with caution; nonetheless, the findings suggest that modification of the work environment might prevent up to one in three of cases of neck and upper limb pain in the general population, depending on current exposures to occupational risk.

According to Andersen et. al; there is Physical, psychosocial, and individual risk factors for neck/shoulder pain with pressure tenderness in the muscles among workers performing monotonous, repetitive work, Work-related physical and psychosocial factors, as well as several individual risk factors, are important in the understanding of neck/shoulder pain. The findings suggest that neck/shoulder pain has a multifactorial nature. Reduced health-related quality of life is associated with subjective pain and clinical signs from the neck and shoulders. The physical workplace factors were highly intercorrelated, and so the effect of individual physical exposures could only be disentangled to a minor degree

To reduce discomfort in the neck and upper back it is highly recommended that working distance should be maintained for optimal posture, with shoulders relaxed and elbows closed to the sides. It is important that 20 degree or less flexion of neck is maintained- this will avoid the operator to hunch over the patient. Dental loupes with magnification of 2x are sufficient to visualize the working field details. Before starting any clinical work, the operator must adjust the arm rest which will improve elbow support and decrease neck and shoulder fatigue. Discomfort in the lower back can be prevented by using a saddle type operator stool with lumbar support. This is to maintain the natural lower back curvature which also allows to the operator to stay closer to the patient. The lumbar support should always stay in contact with the operator's back. There was more WMSD seen in dental

students who had started their clinical years. Neck and lower back are more injury prone areas and are at increased risk of developing musculoskeletal disorders. Theory and practice of ergonomics should be incorporated into the dental undergraduate curriculum.

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Khan and Chew (2009) stated that Four-handed dentistry is accepted as part of the current dental practice, and defined as an ergonomic chair side work arrangement performed by a well –trained dental team in an organized manner. The overall concept provides a synergistic approach to dental practice that provides more efficient delivery of dental care and increased productivity.

Legat et al. (2010) narrated that as part of any infection control protocols, dentists should continue to utilize personal protective measures and appropriate sterilisation or other high-level disinfection techniques. Aside from biological hazards, dentists continue to suffer a high prevalence of musculoskeletal disorders (MSD), especially of the back, neck and shoulders. To fully understand the nature of these problems, further studies are needed to identify causative factors and other correlates of MSD. Continuing education and investigation of appropriate interventions to help reduce the prevalence of MSD and contact

dermatitis are also needed. For these reasons, it is therefore important that dentists remain constantly informed regarding up-to-date measures on how to deal with newer technologies and dental materials.

Work attire and or clinical attire is of equal importance in terms of occupational health and safety. Prescribe working clothes is extremely important to protect the work. Gloves, eye shield, head cap, boots loose clothing are basic in a factory set up. However, clinical gown, facemask are included when working in a clinical or laboratory set up.

Determine first what type of hazards that work entail is the first thing a worker have to consider. Most of visual injuries occur due to the fact that workers either have wrong types of safety eyewear or not wearing anything at all. Correct eyewear selection is essential. It does not follow that just because you are also wearing eye protectors you are not vulnerable to visual accidents. Despite having safety eyewear, the eyewear one must choose should be sufficient enough to offer protection from the impending hazards of one's work. In a dental office, a dental care provider can be expose to a hazardous light intensity of a light curing probe. Direct visual contact with the LED light coming from the light curing probe can cause eye strain which may lead to visual impairment. It is recommended to use a light barrier device during composite resin restoration.

On the other hand, poor lighting during any dental procedure can also lead to eye strain. Proper illumination or additional illumination can help the dentist work in the patient mouth more comfortably.

Kotler (1989) stated in his book Social Marketing, that motivation plays a vital role in promoting a new concept. Awareness is a factor that will trigger the interest of the target adopter, however, it is the motivation that will grab the attention of the target adopter on accepting the new concept, therefore facilitating compliance.

Furthermore, Kotler believed that a target adopter must learn and feel the concept prior to adaptation. This is the principle of social marketing. Allowing the target audience to learn a new concept, or relearning an old concept, followed by letting them feel what the concept is all about. Letting the target adopter or audience to feel the concept and infusing

motivation at the same time. Eventually, the target adopter will accept the concept facilitating compliance.

Waste Management

The number one reason of increase waste accumulation is the increasing population that is constantly consuming natural resources. Consumed resources often end up with by products, known as waste. Most waste is often bound for disposal. Since all countries, developing and fully develop aims of minimizing waste accumulation, are now advocating entrepreneurship focusing of recycling waste. It is now fully evident that most waste product can be recycle and it can offer additional income, minimization of waste and reduce environmental negative impact.

In order to address waste minimization, green marketing campaign is now being positioned in the market. Dalhstrom (2012) stated that Green marketing is defined as the study of all efforts to consume, produce, distribute, promote, package and reclaim products in a manner that is sensitive or responsive to ecological concerns. Let us take in consideration for example the broadsheet papers of almost all states. These broadsheets company are now using recycled papers as part of their effort to lessen their waste production and contribute to waste minimization campaign of the world health organization and the united nation. These broadsheets company will then inform their reader that they are using recycled paper which will in turn acquire the support of the reader. Readers will always support company who are into preservation of natural resources.

Some authors indicate that environment preservation is a social responsibility of not just of a private individual but most importantly by the entrepreneurs, does the birth of green capitalism. Kuratko (N.D) Part of green capitalism's concept is the eliminating the concept of waste. Seek newer methods of production and recycling. In other words, with the concept of green marketing and green capitalism, businesses are motivated toward a stronger environmental awareness.

The concept of waste management started with pollution prevention. Conservatively, pollution prevention basically means minimizing the amount of waste or pollution that will be produced. Pollution prevention is also about conservation of resources, an increase on efficiency with the use of principal raw materials such as water, energy and other resources.

Waste is basically pollutants. And these pollutants can harm the environment and in the end will affect the health of the community. Pollutants are divided in four categories: acid pollutants, physical pollutants, radiological pollutants, and biological pollutants. Also, the British Medical Association categorized hazardous waste into 6 categories: controlled waste, special waste, toxic waste, hazardous wastes, difficult waste and clinical waste.

Hill (1997) stated that in dentistry, dentist are sometimes a contributor of radiological pollutants and biological pollutants. Radiological pollutants are radioactive chemicals found naturally in rocks, water and soil. however, in a dental office, dentist are using x-radiation. Scattered and residual x-radiation are often found in the dental clinics if film coating and film developers are not properly disposed, and at the same time if the facility was not properly designed to contain radiation.

Dentists are also contributor of biological pollutants. Biological pollutant according to literatures are microorganism causing infections and other diseases. Most of the times, dentist are dealing with oral diseases, and dental materials such as cotton, gauze, needle will be contaminated also with such pollutants. If not properly disposed, these materials may spread microorganism causing infection in to the community.

Under the clinical waste introduced by the British Medical Association Medical waste is included. La Grega (2001) stated Medical waste is defined as any waste or reusable materials, other than culture or stocks of an infectious substance, that contains an infectious substance and is generated in the diagnosis, treatment, or immunization of human being or animals; in research pertaining thereto, or in the production or testing of biological, including but not limited to times such as soiled or blood-soaked bandages, discarded surgical gloves and surgical instruments such as scalpels, needles used to give shots or draw blood; removed body organs such as tonsil, appendices, etc; and lancet, the little blades the doctor pricks your finger with to get a drop of blood.

Furthermore, according to La Grega (2001) as early as 1972, medical waste are recognized to as health hazard. Under Resource conservation recovery act of 1972 of United States, hazardous waste was defined to include those wastes with infectious characteristics such as some of the waste generated by hospitals, doctors, dentist, biomedical researchers and the like. In other words, hazardous waste are waste which may introduce and induce health hazard to human and environmental health either by handling or disposal. As the terms implies, Medical (or dental) waste are considered hazardous to health because of the threat that present on the health and life of the entire community and of the environment.

British Medical Association (1991) stated that there are two principal ways in which clinical waste present occupational and health hazards: infectivity and toxicity. Infectivity due to its characteristic to spread infection, and toxicity due to it characteristic to alter biochemical composition of the body.

Since medical waste are recognized and addressed as early as 1972, hazardous waste, including dental healthcare waste cannot be seen as a new problem. Unfortunately, according to British Medical Association (1991) decisions concerning the management of hazardous wastes are increasingly being delegated to lay committee and political bodies whose membership may have no expert knowledge of the subject. Thus affecting the success rate of any program for aims waste management. subsequently, it will also affects the compliance of the health professionals due to its technicality.

In the waste management hierarchy, the top most priority is pollution prevention followed by reuse/recycle treatment and at the bottom is the disposal. Disposal is the least priority because authorities and experts believes that if the top 2 priority which is prevention and recycling/reuse is successful, waste production will be minimize which will result to few, if not none waste are to be disposed.

Most people understand the importance of recycling and are familiar with it. The advantages of recycling is dramatic. Hill (1997) argued that recycling saves more than half of the energies that would be needed to produce a certain product. Reusing product is usually close to recycling because fewer resources are used and less pollution is produced.

Miller and Spoolman (2010) stated that recycling is important, but reducing resource consumption and reusing resources are more effective prevention approaches to reducing the flow and waste of resources. Rephrasing that means, Reusing is superior to recycling. Government can help encourage people to reuse, buy decrease taxes and giving more tax exemption on products made from recycled/reuse materials. While increasing taxes for items that are made from new resources and to those items that has no chance to be reuse.

WHO (2013) stated that in dentistry, waste management is not strictly implemented. Particularly with the use and disposal of mercury. Scandinavian countries already phased out the use of amalgam with mercury in dental offices. Studies have found some dentists to have elevated mercury levels in their blood and urine compared to nondentist. it was also in this study that revealed some dentist showed early sign of neurological damage due to poor mercury management. Thus making mercury as an element inside dental offices as a threat to health of the clinical workforce.

Ever since this study was published, there is significant decrease in the use of amalgam with mercury as a restorative material. Most dentists shifted to composite resin which is tooth colored and is mercury free.

However, dental practitioners are using some chemicals also in their offices. One classic example of chemical being use in a dental office is the x-ray developing solution. Some chemicals can be disposed down the drain; however, it is not the proper way how to dispose chemicals. Doing so might harm the environment.

It is also well known that dentist, are also performing oral surgery. Dentists also generate waste which is biomedical in nature that falls under the clinical waste category of British Medical Association. These are wastes that are soaked with body/oral fluids such as blood and saliva. There are also times that the biomedical waste includes, needles, tooth specimen, gingival tissues and some other kinds of oral tissues. These materials are considered highly infectious due to the present of some microorganism that may and can cause infection.

Knowing all of these dental healthcare waste potential risks to health and well-being of a person and overall safety of the community is not enough. Providing awareness can help,

but without changing the behavior of the public, all these campaign for proper waste management is nothing. This is the reason why, behavior modification of the public on the healthcare waste management is a must.

Social marketing is a strategy for changing and modification of behavior. The term has come to mean a social change management technology involving the design, implementation, and control of programs aimed at increasing the acceptability of a social idea or practice in one or more groups of target adopters.

Concept of waste management must be introduced to the target adopters. Let them understand the concept and guide them closely in order for them to learn, understand and adopt the concept of waste management and eventually, behavior will change. In the end, Level of compliance to health care waste or general waste management will increase.

Rebullida (2000) stated that public awareness is generally regarded as the most important intervention to achieve lifestyle and behavioral changes. This should be directed at the youth and be primarily concern of all sectors but particularly of the educational system. As the general rule, a certain concept must be teach to younger generation so that their behavior will be mold accordingly. Also, when introducing concept to the young generation, they must be surrounded with people who are also practicing the concept. Otherwise, the behavior will not be modify.

President Corazon Aquino on November 2, 1987 created the presidential task force on waste management with the following objectives: identify the effective collection and disposal system or technology sustainable over the long term; reviewing all relevant proposal, concept papers and studies on waste management and putting together a project with technical economic and financial viability; identifying the most appropriate agency to take the lead and the agencies that would support it; providing scavengers alternative sources of livelihood that would prove viable over the long run.

Unfortunately, the lack of political will power to implement laws on waste management contributed to the failure on waste management. because of this, no buildup of community awareness, no change of behavior among the community members, lack of funds, lack of logistics and negative attitude.

Department of health (N.D) stated that all individual exposed to hazardous health care waste are potentially at risk, including those within the health care establishments that generate hazardous outside these sources who either handle such waste or are exposed to it as consequence of careless management.

DOH stated that infectious waste may contain any of a great variety of pathogenic organism. These microorganism can enter the human body can thru different routes and may cause life threatening diseases.

DOH also include Radioactive waste as part of health care waste. In Dental offices, dentist also uses x-ray machines, utilizes xray films and xray developing solutions. These materials are often disposed as part of the general waste. These materials poses residual x-radiation, thought small in quantity, if consolidated may cause certain effect to the health of the community. Also, the chemical being use for developing dental xray films if dispose in the drain may also pollution for water system. As informed by the DOH, Chemical used in health care establishments are potential source of water pollution

Just like the British Medical Association, the Philippine Department of Health labeled health care waste into different categories. But, DOH categorized health care waste into 10, namely: General waste, Infectious waste, pathological waste, sharps, pharmaceutical waste, genotoxic waste, chemical waste, waste with high content of heavy metals, pressurized containers and radioactive waste.

Research presented by Esporlas and Pascual (2015) stated that Local dentist, particularly practicing in Makati 1st district are highly aware of the waste management campaign and protocol prescribed by the Department of Health, however, it was found out the their compliance is very low. Esporlas and Pascual in the end recommended that that local government must exert more effort in supervising health card waste management among dentist. And that the local dental chapter must coordinate with the local government in order to increase compliance of dentists to the waste management campaign of the Department of Health.

Department of Health advocacy is to reduce health care waste thru its program health care waste minimization. The department also, emphasizes the proper ways of handling, storage, transport and disposal of healthcare waste.

Finally, Department of health released their guidelines for ensuring maximum health protection.

Law, policies, guidelines enacted of the authorities are all for the betterment of the society, particularly for the health promotion and security. All of these effort will surely be nothing, if the society will not participate. Therefore a call for an aggressive social marketing campaign is a must to increase the awareness of the people towards healthcare waste management. Also, it is necessary to strictly implements all the rules and guidelines in order to increase the compliance of people when it comes to general and healthcare waste management.

DOLE (2010) stated that the objective of insuance of Occupational health and safety standard is to protect every workingman against the dangers of injury, sickness or death through safe and healthful working conditions, thereby assuring the conservation of valuable manpower resources and the prevention of loss or damage to lives and properties, consistent with national development goals and with the State's commitment for the total development of every worker as a complete human being.

Carnow et. al. (1975) stated in their article that the diseases which are killing American, such as heart disease, stroke, chronic bronchitis, and emphysema, and cancer, are generally multifactorial insidious in onset with long incubation period, and generally irreversible when they emerge clinically. Recognition of the necessity for primary prevention, as the only meaningful way to deal with these diseases, has led to the search for etiological factors. Some of the major diseases which have emerge include those relating to our habits, diet, air pollutants in and out of the workplace, and water supplies polluted by industrial wastes. Job exposures, however, are increasingly being identified as having a significant impact in the multifactorial pathogenesis of important health problems. The ever

growing rate of fatal and disabling injuries in the workplace must also be cause for concern about the health impact of the work environment on the American workers.

Stress Management

Reece and Brandt (2008) defined stress as the behavioral adjustment to change that affects everyone physically and psychologically. It is the process by which a person mobilize energy for coping with change and challenges. They further stated that stress can come from the environment, the body and sometimes from the mind.

Current office operation hours and number of days are not yet regulated. Some dental offices and laboratory are not in service during Sundays to serve as rest day and family day. However, there are some practitioner who still working during Sundays and holidays. Making this professional starved with vacation and rest. Eventually, they will experience burnt out with their work, which will make them inefficient to the services they are providing the patients.

Cooper (1980) in his article stated that the increasing number of cardiovascular diseases, alcoholism, drug abuse, divorce, elevated rates of suicide suggest that the typical life of a general dentist is stressful. Furham (1983) and Sebor (1984) stated that the primary stressor for general dentist are time related pressures, fearful patients, high case loads, financial worries, staff problems, equipment breakdown, defective materials, poor working condition, and the routine and boring nature of the job.

Most dental practitioner tends to over stay in their offices due to high and overloaded patient schedule. One must remember that working beyond and ideal working hour of 7 or 8 hours makes one worker more prone to mistakes, accidents and becomes inefficient with his job. Schwind et. al (1993) agreed that employees working hours must be regulated not to exceed the maximum working hours per day.

Dental professional working in an institution can avail of leave from work to take a vacation. However, Dental Professional working or operating their own offices tends to consume most of their times and days to supervise and run the office operation. Most of the time, starving themselves with vacation and rest. In the end, stress accumulates and make

them inefficient on running their own business. Desler (2000) stated on his book that every professional must have a time off to whatever they are doing. This is to avoid burnt-out from their routine and work.

Some Dental professionals, particularly dentist, are doing multi practice location. Wherein they are joined by other medical professional. They will visit different practice location in a week to cater services to patients. The primary reason why they are doing this is because they want to expand their practices. However, it also became an opportunity for them to change venue and scenery.

Heavy work load schedule also may cause stress to dental practitioner. Particularly with dental laboratory technologist. That they are also bound with time factor to finish the job order sent in by their dentist. Fabrication of intra oral devices and appliances takes time in order to produce a perfect fit to the patient. However, most dental technologies are time constraint and work in a high pace just to meet the deadline. In the end, they tend to stress themselves.

Work Safety

Dole Occupational health and safety provision number 1013 (2010) stated that a work place where workers are exposed so different microorganism such as bacteria, fungi, and parasite are considered to be hazardous workplace. With this condition, health care centers such as ambulatory clinics like dental offices are considered to be hazardous work place due to its high risk of bacteria and other microorganism contamination.

Work Safety climate play a vital role in formulation of workplace intervention to reduce and prevent incidence and severity of accidence within the workplace. Perez et al (2010) stated in their study that remediation and hazard removal are important public health tools and will make for safer environment, but providing necessary resources and training on how to carry out safety behavior and motivation to engage in such behavior sustainably, and voluntarily are all necessary for a better safety workplace climate. Rajendran et. al. (2009)

mention in their study that worker's health and safety must be part of the philosophy and principles of every firms.

According to Palanisamy and Sebastian (2015), Identification and analysis of human suffering and economic loss due to accidents plays an imperative role in preventing accidents by removing or controlling the hazards in industries. Despites improving of accidents prevention and providing safe and healthy work environments, workplace safety still needs improvement. Workplace safety means freedom from incidents that result in injury, damage or loss of life. Accident prevention not only relies on formulating safe mechanism but also on skill and attitude development, knowledge enhancement and morale of industrial workers. Accury et. al (2015) gives emphasis on the what is work climate as the conviction of the employer to provide a safe workplace environment by giving a strong management support and commitment to safety thru safety training, constant communication, safety promotion, control of environment, proper housekeeping and stable workforce. A good addition to this list is the work hours.

Kecklund (2012) stated that work hours make up the framework for day-to-day living and exert major impact on the daily life of people. Night and rotating work time arrangements, plus long working hours, interfere with our basic need for recovery and disturbed social well-being. Stresfull working-tie arragements can cause serious diseases, safety risks and accidents, and they can have a negative impact on productivity.

Presidential decree no. 196 (1977) stated that every establishment should have a proper water system, water drainage system, good ventilation, and a ceiling height of 2.70 meters. Dental offices requires water and water drainage system in order to have a smooth flow of operation. Dental offices also requires good ventilation, for there are time that dentist uses medicaments such as acrylic resin monomer, eugenol, and formocresol which has a strong putrid odor.

Furthermore, a visible route of exit must be established within the office premises. Access must also be designed to accommodate person with disability. And an evacuation plan must be visible for all to see.

Safety management system of any health care industries may it be large, medium or small scale is very important for its effective functioning. Dental clinic is a small-scale industry, yet it offer a high risk of occupational and safety hazard not only to the workforce of the clinic but to the patients as well.

Infection Control

Nabila A. Sedky (N.D) stated that the main objective of infection control program in a healthcare environment is to devise and implement policies and procedures that will protect both workers and patients against transmission of variety of infectious diseases. However, Sedky further elaborated that the ultimate goal of such a program is to create an environment of no risk, or minimizing the risk as much as possible. Sedky reported that majority of his respondents revealed that the do not practice post-infection exposure management.

Healthcare workforce, including Dental professionals may be exposed to a wide array and variety of microorganism from the blood and saliva of the patients. Sedky (N.D) stated that dental procedures are performed in close contact between dentist and patients and require considerable skill in the use of sharp instrument, which create setting where provider and patients are vulnerable to accidents. Sedky also mentioned that even the most experienced practitiones are still predisposed to accidental exposure.

Wong et. all (2013) stated on their research that Chronic hepatitis B has a significant public health impact in the Philippines because it is a common cause of end stage liver disease and is the leading cause of hepatocellular carcinoma, the latter being the fourth leading cancer and the second leading cause of cancer death in the country.

Aside from Hepatitis viruses, HIV also possess significant threat to dental professional and dental patients as well. Occupational health and safety standard for Health care workforce should include prevention of the spread of this disease as well as dissemination of information on how to prevent, cure and stop this viruses.

Morbidity and Mortality Weekly Report (1993) stated that although the principles of infection control remain unchage, new technologies, materials, equipment, and data require continuous evaluation of current infection control practices.

The U.S Public Health Service (2005) provided guidelines for management of occupational exposure to HIV and Recommended postexposure prophylaxis. They stated that postexposure management is an important element of workplace safety. Also, a postexposure management of occupational exposures to Hepatitis B virus and C virus been published previously. Postexposure management includes receiving antiviral drugs, follow up testing, monitoring and counseling. MMWR (2005) stated that providing HCP with psychological counseling is an essential component of the management and care of exposed HCP. Unfortunately, dental professional here in the Philippines are not properly educated of such management.

Microorganism such as mycobacterium tuberculosis, hepatitis viruses, streptococcus and staphylococcus, even herpes simplex virus I and II and HIV can infect the dental team and the patients of the dental offices. Proper infection control must be observe in order to prevent the proliferation and transmission of these microorganism. Infection control includes proper waste disposal. No matter how much effort is given to control spread of infection within dental offices, if waste management is not properly addressed, microorganism will affect not just the dental offices but the entire community as well.

World Health Organization firmly stated that it is essential for all hospitals government and private to have a protocol for dealing with biological waste as well as contaminated waste. WHO also stated that all staff must be familiar with the protocol and must, at all times follow them strictly.

WHO (2007) Healthcare waste management is a vital part of national health care structure. A holistic approach to healthcare waste management should include a clear delineation of responsibilities, occupational health and safety programs, waste minimization and segregation, the development and adoption of safe and environmentally-sound techonologies and capacity building.

As it was discussed from different books, WHO specified that biological waste must be carefully stored, disposed of safely. WHO also stated that contaminated materials such as blood bags, soiled dressings, disposable needles are highly hazardous and must be handle, treated, disposed properly. Mishandling and improper disposal of these contaminated material can infect the community with some form of diseases that could be life threatening.

Biohazard materials disposal is time consuming and comes with a high cost. Therefore, it is essential to segregate non-contaminated materials such as paper, plastic, and non-sterile but not biologically contaminated materials. Reports from WHO indicates that there are of the waste for disposal of a hospital or clinic establishment, 15% to 20% only are considered infectious. This traditional estimate from WHO, however, is not consistent for many developing countries. There are some countries who poses higher rate of medical waste compare to other countries.

Since disposal of biohazard materials are time consuming, it was recommended by WHO to organize things in a way to discourage the need for personnel to be in contact with the contaminated waste. This includes, the use of separate disposal containers which should be color coded to determine where the materials are infectious or not. WHO further recommend black container for non infectious waste, red for infectious and yellow for sharps waste. Health care workers and handlers are advised to use and wear protective gears such as gloves, apron, mask and must be immunized against Hepatitis B virus.

WHO (2003) As for the chemical waste, it is recommended not to mix waste chemical, unless there is certainty that hazardous chemical reaction will not take place. This essential to prevent any unwanted or dangerous reactions between the chemicals, which could endanger laboratory staffs.

WHO (2008) Healthcare services providers generally aim at controlling and preventing diseases such as communicable ones. Controlling and preventing diseases is possible if the public are educated and made aware on how such disease can be prevented. Since, clinical waste poses a threat to the health of the community, because of the possible present of pathogens, health care service providers must also protect the community by ensuring proper health care waste management.

Dentist and his team are dedicated to promote and enhance oral health status and over all well being of an individual. In order to carry out these advocacy, they uses array of materials, instruments and equipments. However, these materials, instruments and equipment, present potential challenges to the environment.

Mercury is naturally occurring heavy metal. It is a highly toxic metal, especially when biotransformed into methyl mercury. It can be very life threatening when inhaled and very toxic if absorbed via skin pores. When mercury vapour is inhaled , it will be absorbed in the blood thru the lungs. It can cause a negative effects to nervous, digestive, respiratory, immune systems of more often to the kidney and lungs.

Mumtaz (2010) Dental Amalgam is the most commonly used dental filling material. It is a mixture of mercury and metal alloy. The normal composition is 45 -55% mercury, approximately 30% silver and other metals such as copper, tin and zinc. In 1991, the World Health Organization confirmed that mercury contained in dental amalgam is the greatest source of mercury vapour in non-industrialized settings, exposing the concerned population to mercury level significantly exceeding those set for food and for air.

In the dental office, amalgam waste disposal is one of the unregulated waste management. More often amalgam wastes are becoming part of the regular municipal waste contributing now to increase areas of being affected with mercury vapor. Therefore, increase the number of people who are now being more and frequently expose to mercury. However, Health regulating bodies such as WHO, American Dental Association, US Public health Service still strongly support the use of dental amalgam for filling dental cavities on terms of strict observance of amalgam waste protocol. Darwish and A-khatib(2006) stated that in the year 2004, the global anthropogenic release of mercury into the environment was more than 5000 metric tons, of which is about 50% originated from Asia. however, there are some countries who are not completely banning mercury for dental amalgam.

In Pakistan, one study indicates that half of the dentist respondents are still advocating the use of dental amalgam but most of the respondents are aware of the threat to the health of mercury. However, very few of these dentist have an amalgam separator in their clinics. Which means majority of these dentist are including amalgam waste into the general waste

container. This situation is clear example of the relationship and differences of awareness from compliance.

Dental clinics and laboratories owners can find themselves confronted with several violations all at once without the funds to address them all. Darwish and A-Khatib (2006) mentioned that there is no doubt that by following the environmental regulation that deal with different types of dental waste, the hazardous effects of such waste can be reduced or even eliminated. Minimizing the effects is highly related to the behavior of the dental service provider. Behavior of these dental services provider can be influence by awareness and policies. In a highly developed countries that have a well written waste management protocol, and well publicized and strictly enforce the compliance level of the community is also very high that makes the waste minimization campaign, and community safety program a success.

The generation of the increasing waste is escalating due to the increasing number of graduate dentist and due to the increasing number of patient becoming aware of the importance of dental health care. This problem poses significant threat to environment and health and should be addressed. Precaution must be taken such as immunization against Hepatitis B virus, proper waste management education and training and social marketing strategy to increase awareness and compliance.

Fire Hazard

Davidson et. al. (2013) mentioned in their study that fire represents one of the most severe environmental hazards for the built infrastructure, and high temperature resistant design is one of the key considerations in the design of civil structures. Professional Safety (2013) stated the fact that business owners generally understand the importance of implementing a fire protection system to keep their workers and customers safe, yet once such a system is installed, failure to perform routine inspections and maintenance can prove as dangerous as the absence of a system. Dole Occupational health and safety provision no. 1060 (2010) mandated that Building premises should have adequate fire, emergency or danger sign and safety instructions of standard colors and sizes visible at all times, following standard color of signage.

Fire damages is exacerbated by a general lack of fully developed fire safety standard. Dental offices are also prone to fire problem particularly when electrical code is violated, and if a fire caught a highly combustible materials inside the dental office. Just recently, end of 2015, a family of dentist are trapped inside their clinic due to fire. Investigation revealed that the fire was due to short circuit due to high voltage usage, the family was trapped and died due to absent of an emergency exist.

There are four components that are necessary to sustain combustion: fuel, heat, oxygen and chemical reaction. However, there are several sources that can cause fire such as paper, combustible materials, faulty wiring etc. Dental clinics are also prone to fire due to the different materials inside the clinics that are fully combustible.

Chow (2014) reported thru his study that developers have started to construct super tall buildings just following fire safety design specification for normal height buildings. Chow (2005) stated that fire safety has drawn greater public attention after numerous of big fires in East Asia. Though Wilson (2015) specified to take time to protect your most important resources by creating an emergency response plan for all employees, visitors and physical facilities. An evacuation plan is necessary for all kinds of industries for the general welfare of its staffs, clients and guest.

Fortunately, building administrator in some locality in the Philippines are working hand in hand with the Bureau of Fire and require all commercial and residential units to participate on the fire prevention workshop yearly. Failure to participate means there will be no renewal of lease or there will be no renewal of business license.

Equipment Maintenance

As previously mentioned, primary stressor for Dental professionals includes equipment breakdown and defective instruments and materials. Equipment breakdown and defective instrument may simple result to stop of operation. On the other hand, a defective materials may result to unsatisfied patients, or worse, risking the health and life of the patient.

Interview with Jim Tomes in Professional Safety (2013) he mentioned that businesses can gain a positive reputation by keeping customers safe and investing wisely in

fire protection equipment, and the need to view maintenance in terms of incident prevention rather merely than conducting it just to comply with codes and standards. He further mentioned that by neglecting to perform regular inspections and maintenance, companies often set themselves up for increased costs later on. When systems fail completely, immediate action is required, and to make repairs within 24 hours, a company will likely pay extra. However, if a routine inspection discovers a noncritical or critical deficiency before it escalates into an impairment deficiency, the company can have the work performed at a regular hourly rate.

Among all the equipment found inside a dental office, it is the dental x-ray unit needs the most attention and periodic calibration and maintenance process. The x-ray unit is very sensitive and hazardous at the same time. Once it is use and is not calibrated, it may emit a tremendous amount of x-radiation exposing not only the dental team but the patients and guest as well.

Frequent exposure to stray x-radiation contribute to a multiple illness and disease process that the dental team, patient and guest may develop. With the risk of having a tremendous amount of stray x-radiation, Radiation Institutes such as Philippine National Radiation Institute recommended that all dental offices operating with dental x-ray units should have one Radiation safety officer to ensure radiation safety.

Dental offices are equipped with generous number of instruments, materials and electronic equipment. Most of the electronic equipment such as fully motorize dental chair, x-ray machine, tooth whitening machine, light curing machine, ultrasonic scalers and others needs periodic maintenance. Any malfunctioning units may result to injuring patients and operators. Therefore it is a must to perform periodic maintenance for all the equipment inside the dental office to provide maximum protection for all patient as well as secure smooth operation of the clinic.

Employees' Protection

In a dental office, the dentist is not the only one responsible for the entire operation. The dentist, more often than not are assisted with secretary, and a chair side dental assistant

(usually the dental hygienist). The entire team are almost always at risk of being expose to different pathogens.

Due to the constant risk the health care workforce of ambulatory clinics such as dental offices, of being expose to different pathogens, World Health Organization provided a guidelines for infection control. However, India Journal (2004) reported that Center for Disease Control released an updated guidelines for infection control. The new guidelines released by CDC in 2004 uses the broader term "standard precautions" which are protocals to protect against exposures to blood, other body fluids including saliva, mucous membranes, and broken skin, rather than " universal precautions," which are measures intended only to prevent exposure to blood.

Different pathogens causes different kinds of disease. And there are pathogens that cannot infection control procedure may not be able to protect the Dental professional completely. This is the reason why, most developed and developing countries mandated a mandatory vaccination to all healthcare workforce members. Stroloffini et. Al (1997) stated that Immunization with tetanus toxoid has been compulsory for all children in Italy since 1968. Vaccination rates are frequently considered a surrogate measure of protection. It would be advisable for the health authorities and National Government, particularly here in the Philippines to identify or screen dental professional of their immunization needs, particularly against tetani and HBV in order to protect the general health of the dental professionals as well as their patients and guest.

MLO (2010) reported that a tremendous numbers of HBV infected patients are due to a dental procedure. Alqahtani et. al. (2014) also reported that a huge number of Health students are in high risk of being infected of HBV due to lack of HB-antibodies. Therefore Alqahtani et. al. (2014) concluded that a structured program to raised awareness of the Health student on blood borne diseases must be established together with vaccination program to prevent outbreak of HBV. The same concept must be applied to Local University and colleges that offers Health allied courses especially schools that is offering Dentistry programs.

Charles Buban (2012) of the Philippine Daily Inquirer stated that Nany healthcare providers are exposed to blood or other body fluids. If such fluid is infected with the hepatitis B virus and comes in contact with the health care provider's blood or mucous membranes (via needlestick injury while drawing blood on a patient, splash by blood or bloody fluid in the eye or mouth while changing suction tubing or working in a laboratory, or cut from a scalpel during surgery), there is a 10 to 30 percent chance of becoming infected with the hepatitis B virus.

Donald Kaye (2007) stated that Infectious Disease Society of America (IDSA) has requested congress to mandate an annual Influenza vaccination to all healthcare work force member. The IDSA believed that annual influenza vaccination is a concrete approach on prevention of the annual influenza epidemic and to prepare for an evitable pandemic. Furthermore, IDSA (2007) stated that all health care workers are at high risk during edpidemic. To maintain a work force that can continue to respond to an ongoing threat and to protect patients as well, physicians, nurses, pharmacists, allied health personnel, first responders and other professionals should be vaccinated as early in each annual epidemic as possible.

The request of IDSA in 2007 was strengthen by the article publish by Yang Lei (2015) that state Seasonal influenza carries a high burden of disease, especially in persons aged 65 or less. Vaccinating health care workers against influenza is an effective strategy to prevent transmission in healthcare settings. Yet despite the widespread availability of the vaccine and strong recommendations for HCW influenza immunization, coverage in many Canadian healthcare organizations is low.

Buban (2012) stated in his articles in the Philippine Daily Inquirer that Healthcare workers face a wide range of hazards on the job, including needlestick injuries, and violence. Although it is possible to prevent or reduce healthcare worker exposure to these hazards, healthcare workers continue to experience injuries and illnesses in the workplace. There is

also the possibility that Health care work force members could unknowingly infect patients. That they are already a carrier of some infectious microorganism.

Abigail Shefer et. al.(2011) defined Health care professional (HPC) as paid and unpaid persons working in health care settings who have the potential for exposure to patients and or to infectious materials, including body substances, contaminated medical supplies and equipment, contaminated environmental surfaces, or contaminated air. The group suggested the concept that the heath care professional contact with patients, or infective materials from patients, HPC area at risk for exposure to vaccine-preventable diseases.

Center for Disease Control and Prevention or CDCP (2011) recommended a secure and computerized systems to manage vaccination record for HCP. CDCP in 2011 has encourage any facility or organization that provides direct patient care to formulate a comprehensive vaccination policy for all HCP.

Philippine Foundation for Vaccination or PFV (2012) released guidelines and schedule of vaccination for Philippine Health Care workers. The foundation specifically requires all first line and support services health care work force members as part of their pre-employment requirements. However, Health care practitioners opening and operating their own ambulatory clinics are not being monitored if they are properly vaccinated prior to opening of their clinics.

Vaccination against, some kinds of viruses such as Hepatitis B, Influenza, and tetani are mandated in some countries such as UK and US before a dental professional can apply for license to operate and open a dental office. However, the current process here in the Philippines, does not required dental professional to undergo such vaccination prior approval of license to operate a dental clinic.

CDCP in 2011 suggested also that managers of health-care facilities should implement catch-up vaccination coverage among newly hired HCP. This strategy according to CDCP could help prevent outbreaks of vaccine-preventable diseases.

Occupational Health and safety does not just pertain to a work place safe from internal hazard but also a work place that give priority to the security of the employees against crime.

Part of employees' protection is strengthening the security of the office/laboratory against crime. Andrade (2011) of Philippine Inquirer stated in her column that armed civilian are pretending to be a patient, will ask for dental checkup and treatment but the real agenda is to robbed the dental clinic. A similar story was written by Mangunay (2013) of Philippine Inquirer stated in her article that as of May 2013 suspect of 19 cases of robbery, rape and killing of dental professionals is loose. According to the article, the dental secretary was rape by someone who pretended to be a patient.

Supervision of the Professionals

There are five regulating bodies that directly supervise the practices of dental professionals: The Professional Regulation Commission, Department of Health, the Local Government Unit and the Dental Associations. Each of this agencies are formed in order to safeguard the general health and welfare of the community and the health work force.

Each dental professional are mandated to secure clearance from these agencies in order to practice their professions. However, the national and local dental associations adopted the occupational health and safety of policies of large scale health establishment. This is a policy that is not suitable for ambulatory clinics (small scale health providers) such as dental clinics and others.

Current regulation for dental professionals to practice their professions includes only the following: PRC registration, after taking and passing the board examination and Paying of the Professional Tax Receipt. If the professional will put up his own clinic or laboratory (except for dental hygienist, who must be working with a registered dentist) it is a must to secure BIR registration, permit to operate form DOH (dental laboratory only) and Barangay Business Permit. DTI registration is optional for both Dental Clinics and Laboratory. It is only needed if the professionals will be using a trade name.

Requirements for registration to any of these agencies does not include occupational health and safety compliance. This is the root cause why most dental professionals are unaware and uncompliant to occupational health and safety standard.

Synthesis

With the presented information above, it is now clear that occupational health and safety protocol or standard is importance to safeguard the properties, health and life of all the member of an organization and of course of the whole community. Therefore, it is now evident that an Occupational health and safety standard model and policy must be drawn specifically for dental professionals.

CHAPTER 3

Methods and Procedure

This chapter discusses the methods of research and the procedure that was used by the investigator in order to answer the problems which was stated in the first chapter of this study. Specifically, this chapter includes discussion of the methods of the research used, the respondents of the study, the sampling technique, the different instruments needed for this research, along with the validation of instruments used as well as the statistical treatment of data to arrive at a valid and reliable interpretation of the results of the study.

Methods of Research

In this study, the descriptive method of research with documentary analysis was employed. The study focused on the present condition. It was practiced in identifying the level of awareness and compliance of the respondents on Occupational Health and Safety Standard. The research design is valuable for closer observation into the practices, behavior, methods and procedure (Calmorin, 2012). It helps to illustrate the relationship and differences between level of awareness and level of compliance among Dental professionals.

Furthermore, utilizing the descriptive type of research for this study was helpful in formulating an enhance OHSS model and policy that will increase the level of awareness and compliance of dental professionals.

This study focused on identifying the level of awareness and compliance of the respondents on Occupational Health and Safety practices.

The study was limited to 226 respondents. 133 dentist with private clinics: 70 from NCR, 47 from Cebu, 16 From Davao. 64 dental laboratory technologist with private laboratory and 29 dental hygienist.

The survey forms were given to the selected respondents through social networking sites such as facebook and Twitter so that they can browse the form in advance. The researcher then distributed hard copy of the survey form to the respondents during the local Cebu Dental Chapters on September 17, 2016. The researcher served as their guest speaker and Table clinic presenter for the said event. This gave the researcher the chance to explain

what is the research all about and explain how to answer in the survey form. Unfortunately, the researcher was not able to attend the 2nd day of Davao Dental Chapter Scientific Convention because of the bombing incident. The researcher then ask the President elect of Davao Dental Chapter to represent him on conducting the Survey during the event. This was the reason why there was a few respondents from Davao.

For this study purposive sampling technique was used to determine the targeted population. This is because the researcher set criteria that the respondents should meet to be able to participate in this study. An individual is selected as part of the sample due to good evidence that he is a representative of the total population (Calmorin, 2012).

The respondents were all from the three selected Economic Growth Center of the Philippines: National Capital Region, Metro Cebu and Metro Davao. To identify the main respondents, the following set of criteria must be met by the respondents: the respondent should be a holder of a valid PRC identification card, with an updated and active membership status in the Philippine Dental Association, ages 21 to 65 years old, actively practicing his or her profession within the three selected Economic Growth Centers, and with at least 3 years of experience as a dental professional.

Data Gathering Instruments Used

The Questionnaire was used in this study for collecting and analyzing the data. Important details such as profile in terms of name, age, gender, profession and location of practice was obtained and recorded at the same time using this approach. The Questionnaire included seven key areas of OHSS, namely, general safety and health, workplace exit and access, fire protection, general environment and housekeeping, instruments, equipment and materials, heathcare waste management and employees's protecton intended to assess the evaluation of existing OHSS practices.

Validation of the Instrument Used

The primary procedure in gathering data for this study was the questionnaire. It was submitted to the researcher's adviser for critiquing, evaluation and validation. Furthermore, the questionnaire was further evaluated by the employed statistician of the researcher.

When correction, suggestion and recommendations from the adviser and the statistician was incorporated, the researcher conducted a dry-run of the study. The Trial study utilized the questionnaire to ten (10) respondents of the same criterion to identify weaknesses and loop holes of the instrument.

The data gathered from the dry-run were subjected for further evaluation. After assessment and another questionnaire improvement, the edited questionnaire was used in the actual study.

Data Gathering Procedure

1. **Use of questionnaires.** The researcher gathered information of the respondents using this instrument. The researcher obtained the respondents' profile such as name, age, gender, profession and location of practice. The second part of the questionnaire were used by the respondents to rate themselves on their level of awareness and degree of compliance to Occupational health and Safety Standard.

2. **Interview.** The researcher interviewed some experts on OHSS and BOSH.

Statistical Treatment of Data

For accurate interpretation of result, the following statistical tools were employed:

1. Percentage. This was used to determine the profile of the respondents according to age, gender, location of practice and profession, the researcher used the percentages statistical treatment using the following formula:

$$\% = \left(\frac{f}{N}\right) x\ 100$$

Where: % = Percent
F = Frequency
N = Number of Cases

2. Weighted mean. This was used to in order to determine the level of awareness and degree of compliance of the respondents on occupational and safety standard, the weighted mean were employed and a corresponding Likert scale for data interpretation as shown below:

Formula of Weighted mean:

$$\bar{X}_w = \sum w_i x_i / \sum w_i$$

Where: $\bar{X}_w$ = *Weighted item*

w_i = *weight of ith item x*

x_i = *value of the ith item x*

The Likert's Scale: Adopted from previous study presented in Hong Kong International Dental Expo and Symposium by Dr. Esporlas.

Awareness	*Scale*	*Compliance*
Extremely Aware	*4.81 – 5.00*	Extremely Compliant
Moderately Aware	*3.81 – 4.80*	Moderately Compliant
Somewhat Aware	*2.81 – 3.80*	Somehow Compliant
Slightly Aware	*1.82 – 2.80*	Slightly Compliant
Not at all Aware	*1.00 -1.81*	Not At all Compliant

3. Simple Correlation. This was used to determine what significant relationship exist in the respondents' level of awareness and degree of compliance, the Pearson R correlation coefficient were employed using the following formula:

$$r = \frac{N\Sigma xy - (\Sigma x)(\Sigma y)}{\sqrt{[N\Sigma x^2 - (\Sigma x)^2][N\Sigma y^2 - (\Sigma y)^2]}}$$

Where:

N	=	number of pairs of scores
Σxy	=	sum of the products of paired scores
Σx	=	sum of x scores
Σy	=	sum of y scores
Σx^2	=	sum of squared x scores
Σy^2	=	sum of squared y scores

The computed r was tested at 0.05 to 0.01 levels of significance.

4. T Test. This was used to test the significant differences on occupational health and safety standard base on the seven key areas in terms of awareness and compliance included in the study using the following formula:

$$t = \frac{\bar{d}}{s_d/\sqrt{n}}$$

5. ANOVA. This was used to test the significant difference on the level of awareness and degree of compliance of the respondents on the Occupational Health and Safety Standard when grouped according to the profile variables, ANOVA was employed using the following formula:

$$F = \frac{MST}{MSE}$$

Where,
F = Anova Coefficient
MST = Mean sum of squares due to treatment
MSE = Mean sum of squares due to error.
Formula for MST is given below:

$$MST = \frac{SST}{p-1}$$
$$SST = \sum n(x - \bar{x})^2$$

Where,
SST = Sum of squares due to treatment
p = Total number of populations
n = Total number of samples in a population.
Formula for MSE is given below:

$$MSE = \frac{SSE}{N - p}$$
$$SSE = \sum (n-1)S^2$$

Where,

SSE = Sum of squares due to error

S = Standard deviation of the samples

N = Total number of observations.

6. Duncan Multiple Range. This was used to test which of the respondents shows significant difference on the level of awareness and compliance Duncan Multiple Range was employed.

$$R_p = r_{\alpha,p,\nu}\sqrt{MSE/n}$$

Where

$r_{a,p,n}$ is the *Duncan's Significant Range Value* with parameters

p = range-value

n = MSE degree-of-freedo

experiment-wise alpha level ***a*** (= a_{joint}).

CHAPTER 4

Presentation, Analysis and Interpretation of Data

This chapter deals with the presentation, analysis and interpretation of data gathered to evaluate the level of awareness and compliance of dental practitioners on the Occupational Safety and Health Standard.

The statistics being interpreted and discussed were presented in tabular form.

I Demographic profile of the respondents

Table 1 to 4 presents the demographic profile of the respondents

1. Age

Table 1
Age Distribution of the Respondents

	Age range	Frequency	Percent	Valid Percentage	Cumulative percent
Valid	22 and below	4	1.8	1.8	1.8
	23 to 28	81	35.8	36.3	38.1
	29 to 33	32	14.2	14.3	52.5
	34 to 39	28	12.4	12.6	65.0
	40 to 44	39	17.3	17.5	82.5
	45-49	25	11.1	11.2	93.7
	50 and above	14	6.2	6.3	100.0
	Total	223	98.7	100.0	
Missing	system	3	1.3		
Total		226	100.0		

Table 1 shows that the respondents are classified according to seven age group. 22 and below, 23 to 28, 29 to 33, 34 to 39, 40 to, 44, 45 and 49, and 50 above. There were 4 respondents, or 1.8% falls under 22 and below. There were 81 respondents or 36.3% belongs to age group 23 to 28 years old. 32 respondents or 14.3% were members of age group 29 to 33 years old. 34 to 39 years old age group had 28 or 12.6% of the total respondents. Thirty nine respondents or 17.5% of the total respondents belongs to 40 to 44 age group. 11.2% or 25 of the respondents were under age group 45-49. Finally, 14 respondents or 6.2% were part of the 50 and above age group.

Most of the respondents belong to 23-28 age group.

2. Gender

Table 2
Gender Distribution of the Respondents

Gender	Frequency	Percent
Male	95	42
Female	131	58
Total	226	100

Table 2 showed that there were a total of 226 respondents. 42% or 95 respondents are male. The remaining 131 respondents or 58% of respondents are Female.

Majority of the respondents are female.

3. Location of practice

Table 3
Distribution of Respondents According to Location of practice

LOCATION	FREQUENCY	PERCENT
CEBU	68	30.1
DAVAO	54	23.9
NCR	104	54.1
TOTAL	226	100

Table 3 reveals the location distribution of the respondents. It was reveals that majority of the respondents are from NCR with total number of frequency of 104 representing 54.1% of the total number of the respondents. Sixty eight respondents or 30.1% were from Cebu. Lastly, the remaining 54 respondents or 23.9 % to the total respondents are from Davao.

The researcher was not able to reach the target number of respondents in Davao because some respondents refuses to participate and some was not able to attend the Davao Dental Seminar due to the bombing incident.

4. Profession

Table 4
Distribution of Respondents According to Profession

Profession	Frequency	Percent	Cumulative Percent
Dental Technologist	64	28.3	28.3
Dental Hygienist	29	12.8	41.2
Dentist	133	58.8	100.0
Total	226	100.0	

Table 4 discloses that majority of the respondent are dentists with total number of 133 or 58.8% of the total respondents. 28.3% or 64 of the respondents are dental Technologist and the remaining 12.8% or 29 respondents are dental laboratory hygienist.

Majority of the respondents are dentists.

Table 5 presents the distribution of dental professional per location.

Table 5
Distribution of Respondents According to Profession per Location

Location	PROFESSION	Frequency	Percentage	Cumulative Percentage
NCR	DENTIST	70	46%	46%
	DENTAL HYGIENIST	13		
	Dental Tech	21		
	Total	104		
Davao	DENTIST	16	23.9%	69.9%
	DENTAL HYGIENIST	6		
	Dental Tech	32		
	Total	54		
Cebu	DENTIST	47	30.1	100%
	DENTAL HYGIENIST	10		
	Dental Tech	11		
	Total	68		
Total Respondents		226	100%	

Table 5 reveals the distribution of according to profession per location of practice. NCR has a total of 104 respondents which is 46% of the total respondents. Seventy of this respondents are dentist, 13 are dental hygienist and 21 are dental technologist. Davao has a total of 54 or 23.9% of the total respondents. Among this are 16 dentist, 6 dental hygienist

and 32 dental technologist. Lastly, Cebu has a total of 68 respondents which is 30.1% of the total respondents. Of this number of respondents, 47 are dentist, 10 are dental hygienist and 11 dental technologist.

Davao has the least number of respondents despite of it is one of the key city with the most number of registered dental professional. This is due to most dental professionals in Davao was not able to attend the Davao Dental Chapter Conference due to the recent bombing incident.

The profile table show that the respondents of this study are mostly female and relatively young. Most of them are within the age range of 23 to 28 years old. Majority of them are practicing dentists located in NCR.

Table 6 presents the perception of the respondents on the Occupational health and safety key areas.

Table 6
Perception of Importance of the Respondents on the
Occupational Health and Safety Key Areas

Statement	WM	
General safety and Health	4.83	Imp
Employee's Protection	4.68	Imp
Machine and Equipment	4.64	Imp
Fire Protection	4.63	Imp
Materials	4.56	Imp
Housekeeping and General work environment	4.56	Imp
Waste Management	4.55	Imp
Work Place	4.45	Imp
Exits and Access	4.42	Imp

Table 6 reveals that the respondents give highest importance to General Safety which received a weighed mean score of 4.83. The second and third key areas that received a high score are Employees protection and Machine and Equipment with weighted mean score of 4.68 and 4.64 respectively. The other key areas received a weighted mean score signifying

important also. However, the areas that received the lowest score, and is considered as weakness are Waste management, Work Place, and Exit and Access with mean scores of 4.55, 4.45 and 4.42 repectively.

II Level of Awareness of the Respondents' on Occupational Health and Safety Standard

Table 7 presents the level of awareness of all responents on key areas of occupational health and safety standard.

Table 7
Level of Awareness of the Whole Respondents on Key Areas of Occupational Health and Safety Standard

Key Areas	Weighted Mean	Interpretation
General Work Environement and House Keeping	4.54	Moderately aware
Machine, Equipment and Materials	4.36	Moderately aware
General Safety and Health	4.28	Moderately aware
Fire Protection	4.27	Moderately aware
Work place, Exit and Access	4.22	Moderately aware
Employees' Protection	4.16	Moderately aware
Health Care Waste Management	4.01	Moderately aware
Overall Awareness	**4.22**	**Moderately aware**

Scale

Awareness	Scale
Extremely Aware	4.81 – 5.00
Moderately Aware	3.81 – 4.80
Somewhat Aware	2.81 – 3.80
Slightly Aware	1.81 – 2.80
Not at all Aware	1.00 -1.81

Table 7 presents the tabulation of levels of awareness of the whole repondents on key areas of occupational health and safety standard. It reveals that the top 3 key areas that have the highest mean score on the level of awareness are: General work environment and housekeeping, Machine, equipment and materials, and General safety and health as shown by the means scores of 4.54, 4.46 and 4.28 respectively.

Table 7 also presents the 3 key areas where the respondents have the lowest mean score on level of awareness on occupational health and safety standard. These are the work place, exit and access, employees' protection and Healthcare waste management. It garnered mean score of 4.22, 4.16 and 4.01 respectively.

As presented also in table 7, the respondents has an overall mean score of 4.22 on the level of awareness on occupational health and safety standard, which is interpreted as moderately aware.

Table 8 presents the separated tabulation of level of awareness of each dental professionals on key areas of occupational health and safety standard.

Table 8
Comparison of Overall level of Awareness on key areas of
Occupational Health and Safety of the Three Groups of Dental Professionals

Key Areas	Dental Professionals	Over all mean	Interpretation
General Safety and Health	Dentist	4.27	Moderately Aware
	Dental hygienist	4.27	Moderately Aware
	Dental lab Tech	4.29	Moderately Aware
Work place, Exit and Access	Dentist	4.28	Moderately Aware
	Dental hygienist	4.03	Moderately Aware
	Dental lab Tech	4.17	Moderately Aware
Fire Protection	Dentist	4.30	Moderately Aware
	Dental hygienist	4.19	Moderately Aware
	Dental lab Tech	4.24	Moderately Aware
General Work Environement and House Keeping	Dentist	4.67	Moderately Aware
	Dental hygienist	4.30	Moderately Aware
	Dental lab Tech	4.37	Moderately Aware
Machine, Equipment and Materials	Dentist	4.46	Moderately Aware
	Dental hygienist	4.18	Moderately Aware
	Dental lab Tech	4.24	Moderately Aware
Health Care Waste Management	Dentist	4.07	Moderately Aware
	Dental hygienist	3.87	Moderately Aware
	Dental lab Tech	3.96	Moderately Aware
Employees' Protection	Dentist	4.25	Moderately Aware
	Dental hygienist	3.97	Moderately Aware
	Dental lab Tech	4.07	Moderately Aware
Overall	Dentist	4.28	Moderately Aware
	Dental hygienist	4.07	Moderately Aware
	Dental lab Tech	4.15	Moderately Aware

Scale

Awareness	Scale
Extremely Aware	4.81 – 5.00
Moderately Aware	3.81 – 4.80
Somewhat Aware	2.81 – 3.80
Slightly Aware	1.81 – 2.80
Not at all Aware	1.00 -1.81

Table 8 reveals that all dental professionals are moderately aware of the key areas on occupational health and safety standard as evidenced by mean score ranges from 3.81 to 4.80.

Table 8 further reveals the overall level of awareness of each dental professionals. Dentists means score is 4.28, Dental laboratory technologist is 4.15 mean score and dental hygienist with the lowest mean score of 4.07. All of these score are interpreted as moderately aware.

III The Degree of Compliance of the Respondents on Occupational Health and Safety Standard

Table 9 presents the degree of compliance of all respondents on key areas of occupational health and safety standard.

Table 9
Degree of Compliance of the Whole Respondents on Key Areas of Occupational Health and Safety Standard

Key Areas	Weighted Mean	Interpretation
General Work Environement and House Keeping	4.14	Moderately compliant
Machine, Equipment and Materials	4.0	Moderately compliant
General Safety and Health	3.84	Moderately compliant
Work place, Exit and Access	3.79	Somehow compliant
Fire Protection	3.78	Somehow compliant
Employees' Protection	3.64	Somehow compliant
Health Care Waste Management	3.53	Somehow compliant
Overall Compliance	**3.77**	**Somehow compliant**

Compliance	Scale
Extremely Compliant	4.81 – 5.00
Moderately Compliant	3.81 – 4.80
Somehow Compliant	2.81 – 3.80
Slightly Compliant	1.81 – 2.80
Not At all Compliant	1.00 -1.81

Among the 7 key areas, the top 3 key areas that the respondent evaluated with a high mean score are the General work environment and housekeeping, machine, equipment and materials, general safety and health. These scores are 4.14, 4.0 and 3.84 respectively. This scores are interpreted as moderately compliant.

On the other hand, Table 9 also reveals that the respondents are somehow compliant on the following key areas: work place, exit and access, fire protection, employees' protection, and healthcare waste management. These has mean scores of 3.79, 3.78, 3.64, and 3.53 respectively. Furthermore, the respondent somehow compliant to the overall degree of compliance on the occupational health and safety standard due to the general weighted mean of 3.77.

Table 10 presents the tabulation of overall level of compliance on key areas of occupational health and safety standard of the three dental professionals.

Table 10
Comparison of Overall level of Compliance on key areas of
Occupational Health and Safety of the 3 Dental Professionals

Key Areas	Dental Professionals	Over all mean	Interpretation
General Safety and Health	Dentist	3.95	Moderately Compliant
	Dental hygienist	3.72	Somehow Compliant
	Dental lab Tech	3.69	Somehow Compliant
Work place, Exit and Access	Dentist	3.90	Moderately Compliant
	Dental hygienist	3.36	Somehow Compliant
	Dental lab Tech	3.74	Somehow Compliant
Fire Protection	Dentist	3.86	Moderately Compliant
	Dental hygienist	3.38	Somehow Compliant
	Dental lab Tech	3.78	Somehow Compliant
General Work Environement and House Keeping	Dentist	4.77	Moderately Compliant
	Dental hygienist	3.65	Somehow Compliant
	Dental lab Tech	3.90	Moderately Compliant
Machine, Equipment and Materials	Dentist	4.17	Moderately Compliant
	Dental hygienist	3.57	Somehow Compliant
	Dental lab Tech	3.83	Moderately Compliant
Health Care Waste Management	Dentist	3.61	Somehow Compliant
	Dental hygienist	3.23	Somehow Compliant
	Dental lab Tech	3.49	Somehow Compliant
Employees' Protection	Dentist	3.77	Somehow Compliant
	Dental hygienist	3.19	Somehow Compliant
	Dental lab Tech	3.57	Somehow Compliant
Overall	Dentist	3.89	Moderately Compliant
	Dental hygienist	3.41	Somehow Compliant
	Dental lab Tech	3.68	Somehow Compliant

Compliance	Scale
Extremely Compliant	4.81 – 5.00
Moderately Compliant	3.81 – 4.80
Somehow Compliant	2.81 – 3.80
Slightly Compliant	1.81 – 2.80
Not At all Compliant	1.00 -1.81

On the general safety and health, Dentist has a mean score of 3.95 which is moderately compliant, while dental hygienist has 3.72 and dental technician has a score of 3.69 which is both interpreted as somehow compliant.

In terms of Work place, Exit and Access, Dentists categorized this as moderately compliant with a mean score of 3.90. while both dental hygienist and dental technician gave a verbal interpretation of somehow compliant due to the mean score of 3.36 and 3.74 respectively.

Key area on Fire protection categorized dentists as moderately compliant with mean score of 3.86. dental hygienist and dental lab tech has mean score of 3.38 and 3.78 respectively, categorizing them under somehow compliant category.

For the key area General work environment and housekeeping, both dentists and dental laboratory technologist are categorized as moderately compliant with mean score of 4.77 and 3.90 respectively. Dental hygienist is under the category of somehow compliant due to the mean score of 3.65.

In terms of Machine, equipment and materials key area, table 10 showed that both dentists and dental tech are moderately compliant with mean scores of 4.17 and 3.83. while dental hygiene is put in somehow compliant category with mean score of 3.57.

Healthcare waste management and employees protection are the key areas that all respondents falls under category somehow compliant. Mean score of all respondents are within the range of 2.81 to 3.80.

The Overall degree of compliance on occupational health and safety standard of dentist are moderately compliant with mean score of 3.89, while dental hygienist and dental technologist are somehow compliant only after receiving a general weighted mean of 3.41 and 3.68 respectively.

IV Significant Relationships that Exist in the Respondents' Level of Awareness and Degree of Compliance on Occupational Health and Safety Standard.

Table 11 presents the relationship of the respondents' awareness to compliance on occupational health and safety standard.

Table 11
Relationship of the Respondents' Awareness to Compliance on Occupational Health and Safety Standard

Key Areas	Correlation	Interpretation
General Safety and Health	0.568	Strong Positive Relationship
Work place, Exit and Access	0.721	Strong Positive Relationship
Fire Protection	0.535	Strong Positive Relationship
General Work Environement and House Keeping	0.714	Strong Positive Relationship
Machine, Equipment and Materials	0.619	Strong Positive Relationship
Health Care Waste Management	0.742	Strong Positive Relationship
Employees' Protection	0.712	Strong Positive Relationship
Overall Awareness and Compliance	**0.780**	Strong Positive Relationship

All key areas receive a correlation value of more than 0.50 signifying a strong positive relationship. Hence an increase in awareness warrant an increase to compliance.

Table 11 further reveals the overall awareness and compliance of respondents on the occupational health and safety standard which has a correlation score of 0.780 signifying a strong positive relationship.

This findings presented in table 11 is valuable for the all the agencies governing the practice of dental professionals. The data established that awareness plays a vital role in increasing compliance. Therefore, agencies such as PRC, DOH, Dental associations and local government unit will now have the basis to increase their effort to promote awareness on occupational health and safety among dental professionals.

V Significant Differences Exist in the Respondents' Level of Awareness and Compliance on Occupational Health and Safety Standard When Group According to Profile.

Table 12 presents the result of T-test of the respondents' awareness and compliance on occupational health and safety standard.

Table 12
T-test of the Respondents' Awareness to Compliance on
Occupational Health and Safety Standard

Key Areas		Mean	t	P	Sig
General Safety and Health	awareness	4.28	10.846	0.000	SD
	compliance	3.84			
Work place, Exit and Access	awareness	4.22	11.980	0.000	SD
	compliance	3.79			
Fire Protection	awareness	4.27	10.545	0.000	SD
	compliance	3.78			
General Work Environement and House Keeping	awareness	4.54	11.543	0.000	SD
	compliance	4.14			
Machine, Equipment and Materials	awareness	4.36	9.017	0.000	SD
	compliance	4.0			
Health Care Waste Management	awareness	4.01	11.571	0.000	SD
	compliance	3.53			
Employees' Protection	awareness	4.16	12.217	0.000	SD
	compliance	3.64			
Overall Awareness and Compliance	awareness	**4.22**	**14.518**	0.000	SD
	compliance	**3.77**			

Table 12 reveals the t-test result of the respondents' awareness against compliance on the occupational health and safety standard. It is reveals that the awareness mean of all key areas are higher when compared to compliance resulting to a P value on all key areas of 0.000 signifies significant difference. Furthermore, table 12 shows that the overall awareness and compliance has a P value of 0.000 which mean there is a significant difference on the overall level of awareness and overall degree of compliance of the respondents on occupational health and safety standard.

Table 12 also strengthens the claim of previous research presented by Esporlas and Pascual (2015) that dentist have moderately awareness on waste management but has a low degree of compliance. Furthermore, employees' protection awareness and compliance also showed a significant difference.

Protection of employees includes membership and updated Philhealth and SSS contribution, preventive vaccination and general health checkup. With the data presented from table 12, it is reveals that dental professional are indeed in high risk of exposure to dental occupational health and safety hazard. This is definitely a call for the Professional Regulation Commission to update their requirement on professional registration and renewal of license.

Preventive screening and vaccination as well as post exposure vaccination is of high importance in terms of Occupational health and safety standard. Unfortunately, table 12 indicated that the respondents are highly aware but with low compliance. This is now a major calling for paradigm shift on the Department of Health. A policy must be proposed on their part to ensure compliance of their healthcare workforce to an annual full medical checkup, preventive and post exposure vaccination.

Table 13 presents tabulation of overall relationship of the respondents' awareness to compliance on occupational health and safety standard according to age group.

Table 13
Overall Relationship and Difference of all the Respondents' Awareness to Compliance on Occupational Health and Safety Standard According to Age group

			Paired Sample Correlation		Paired Sample Test		
Age group	Overall	Mean	Correlation	Interpretation	t	P	Sig
22 and below	awareness	4.84	0.642	Strong positive relationship	0.478	0.666	NSD
	compliance	4.81					
23-28	awareness	4.03	0.691	Strong positive relationship	10.646	0.000	SD
	compliance	3.49					
29-33	awareness	4.24	0.795	Strong positive relationship	5.636	0.000	SD
	compliance	3.78					
34-39	awareness	4.26	0.792	Strong positive relationship	5.009	0.000	SD
	compliance	3.86					
40-44	awareness	4.33	0.815	Strong positive relationship	5.299	0.000	SD
	compliance	3.93					
45-49	awareness	4.37	0.742	Strong positive relationship	3.760	0.001	SD
	compliance	4.0					
50 and above	awareness	4.30	0.666	Strong positive relationship	2.785	0.015	SD
	compliance	3.96					

All age group reveals a correlation value for awareness and compliance more than 0.50 signifying strong positive relationship on every key areas of occupational health and safety standard.

Table 13 also presents tabulation of paired sample test of the respondents' awareness to compliance on occupational health and safety standard according to age group. Age group 22 and below showed no significant difference due to the P value of 0.666. However, the other age group presented P value less than 0.05 signifying significant difference between level of awareness and degree of compliance on occupational health and safety standard.

Table 14 presents tabulation of the correlation analysis of the respondents' awareness to compliance on occupational health and safety standard based on genders.

Table 14
Correlation and T-test of the Respondents' Awareness to Compliance on Occupational Health and Safety Standard According to Gender

Descriptive Statistics			Paired Sample Correlation		Paired Sample Test		
Gender	Overall	Mean	Correlation	Interpretation	t	P	Sig
Male	awareness	4.18	0.787	Strong positive relationship	10.191	0.000	SD
	compliance	3.73					
Female	awareness	4.24	0.776	Strong positive relationship	10.451	0.000	SD
	compliance	3.80					

Male respondents has a computed correlation value of 0.787 while female respondents has 0.776. Both genders have a strong positive relationship for awareness and compliance on occupational health and safety standard.

Furthermore, table 14 showed the result of paired sample test of the respondents' awareness and compliance on occupational health and safety standard. Both gender has a computed P value of 0.000 signifying significant difference on the respondents' awareness and compliance on occupational health and safety standard.

Table 15 presents tabulation of the correlation analysis of the respondents' awareness to compliance on occupational health and safety standard based on location.

Table 15
Correlation Analysis and T-test of the Respondents' Awareness to Compliance on Occupational Health and Safety Standard According to Location

Descriptive Statistics			Paired Sample Correlation		Paired Sample Test		
location	Overall	Mean	Correlation	Interpretation	t	P	Sig
NCR	awareness	4.41	0.727	Strong positive relationship	7.257	0.000	SD
	compliance	4.07					
Cebu	awareness	4.04	0.811	Strong positive relationship	9.407	0.000	SD
	compliance	3.57					
Davao	awareness	4.08	0.731	Strong positive relationship	10.431	0.000	SD
	compliance	3.45					

The three selected economic growth center has a resulting correlation values higher than 0.50 indicating a strong positive relationship on the respondents' level of awareness and degree of compliance on occupational health and safety standard.

On the other hand, table 15 shows the result of paired sample test of the respondents' awareness and compliance on occupational health and safety standard. All economic growth centers received a computed P values of 0.000 implying significant difference on the respondents' level of awareness and degree of compliance on occupational health and safety standard.

Table 16 presents Analysis of Variance of overall awareness on occupational health and safety standard according to the age group of the respondents.

Table 16
Significant Difference on Overall Awareness on Occupational Health and Safety Standard According to Respondent's Age Group

Overall awareness	Sum of square	F	Sig
Between groups	3.013	2.398	0.058
Within group	54.533		
Total	57.547		

An F value of 2.398 and P Value of 0.058 reveal that all age group has no significant difference on the level of overall awareness on occupational health and safety standard.

Table 17 presents two tailed t-test of overall level awareness of the respondents on occupational health and safety standard according to gender.

Table 17
T-Test to Determine Significant Difference on the Overall Awareness on Occupational Health and Safety Standard According to Gender.

Awareness	P (2-tailed)	Significance
Overall Awareness	0.401	NSD

The table 17 further reveals a P value of 0.401 which signifies no significant difference on the overall level of awareness on occupational health and safety between genders.

Table 18 presents the mean, relationship, and differences of the respondents' level of awareness and degree of compliance on OHSS in terms of the different components of general safety and health.

Table 18
Significant Relationship and Differences on the Respondents' Level of Awareness and Degree of Compliance on OHSS General Safety and Health Components

Statement	Awareness	Compliance	Correlation	P. Value
Hospital should be within 5 Kilometre from the workplace or is accessible within 25 minutes.	4.33	3.8	0.533	0.000
Transportation can be provided in case of emergency.	4.32	3.78	0.589	0.000
Work place is free from hazards that are likely to cause physical harm to the workers, patients and guests.	4.36	3.76	0.586	0.000
Substituting a non-toxic biodegradable cleaner for a hazardous chemical cleaner.	4.02	3.7	0.605	0.000
Reuse product over and over again for a given function as intended	4.02	3.92	0.593	0.000
Select reusable rather than disposable products whenever possible	4.42	3.87	0.534	0.000
Set reliable standards for disinfection and sterilization of equipment and materials for use	4.44	3.93	0.549	0.000
Practice Recycling	4.28	3.91	0.533	0.000
Practice Waste Segregation	4.33	3.89	0.593	0.000
General weighted mean	**4.28**	**3.84**	**0.568333**	**0.000**

Table 18 reveals that the level of awareness of the respondents are for each component of general safety and health key area of OHSS is moderately aware. The component the respondents have the highest score in terms of awareness on general safety and health is the setting of reliable standards for disinfection and sterilization of equipment and materials. While the lowest score was given to the reusing of products and selection of reusable products.

On the other hand, table 18 also reveals that the degree of compliance of the respondents to each component of general safety and health key area of OHSS is somehow

compliant only. The component to which the respondents is most compliant is the setting of reliable standards for disinfection and sterilization of equipment and materials. And the lowest score is in the substituting a nontoxic biodegradable products.

Correlation reveals positive relationship, hence and increase in awareness to the different components of general safety and health warrant an increase to the compliance component. Furthermore, table 18 reveals that all components are statistically different on the level of awareness and degree of compliance because of P value of 0.000 on each component.

Table 19 presents the mean, relationship, and differences of the respondents' of level of awareness and degree of compliance on OHSS in terms of the different components of workplace, exit and access.

Table 19
Significant Relationship and Differences of the Respondents' Level Of Awareness and Degree of Compliance on OHSS Workplace, Exit And Access Components

Statement	Awareness	Compliance	Correlation	P. Value
The work place is properly ventilated	4.2	3.89	0.734	0.000
The work place has flat and leveled flooring	4.01	3.76	0.696	0.000
The work place has enough height ceiling distance from the floor	3.99	3.79	0.733	0.000
The work place is provided with clean and well maintained lavatory and toilet.	4.1	3.78	0.789	0.000
The door can facilitate exit and entry of PWD in a wheel chair	4.32	3.76	0.686	0.000
The work place installed signages of the emegergency exit direction and location	4.2	3.72	0.705	0.000
The work place exits are not blocked.	4.32	3.89	0.693	0.000
The Work place exits can be easily open from the inside.	4.36	3.87	0.734	0.000
The work place has a displayed evacuation plan in all corners.	4.1	3.69	0.749	0.000
The work stations has enough distance from each other.	4.02	3.88	0.733	0.000
The work place emergency exits cannot be opened from the outside	4.42	3.8	0.693	0.000
The work place has stocks of survival kits and first aid kits	4.44	3.73	0.678	0.000
The work place is in far proximity from establishment that emits radiation	4.28	3.61	0.741	0.000
the work place has no exposed plumbing from on the floor	4.33	3.99	0.745	0.000
general weighted mean	4.222308	3.79	0.721154	0.000

Table 19 reveals that the level of awareness of the respondents for each component of workplace, exit and access key area of OHSS is moderately aware. The component the

respondent recorded the highest score in terms of awareness on workplace, exit and access is the work place has stocks of survival kits and first aid kits with a score of 4.44. While the lowest score is the work place has enough height ceiling distance from the floor with a score of 3.99.

On the other hand, table 19 also reveals that the degree of compliance of the respondents on each component of workplace, exit and access key area of OHSS is somehow compliant only. The component to which the respondents gave the most compliant interpretation is the work place has no exposed plumbing from on the floor with a mean score of 3.99. And the lowest score is in the work place is in far proximity from establishment that emits radiation with mean score of 3.61.

Correlation reveals positive relationship, hence and increase in awareness to the different components of workplace, exit and access assured an increase to the compliance component. Furthermore, table 19 reveals that all components are statistically different on the level of awareness and degree of compliance because of P value of 0.000 on each component.

Table 20 presents the mean, relationship, and differences of the respondents' level of awareness and degree of compliance on OHSS in terms of the different components of fire protection.

Table 20
Significant Relationship and Differences on the Respondents' Level of Awareness and Degree of Compliance on OHSS Fire Protection Components

Statement	Awareness	Compliance	Correlation	P. Value
The work place has a Fire and protection clearance from the Bureau of Fire and Protection.	4.32	3.79	0.525	0.000
The work place has enough power outlet	4.31	3.78	0.576	0.000
The work place has no power extension cord that is lying around	4.11	3.76	0.535	0.000
The work place has its own Fire extinguisher	4.12	3.72	0.528	0.000
The work place has an installed Water sprinkler system	4.42	3.85	0.53	0.000
Work place has an installed smoke and fire alarm	4.29	3.87	0.519	0.000
The work place has fuse/short circuit box that is visible and accessible anytime and is easy to operate	4.33	3.69	0.533	0.000
general weighted mean	4.271429	3.78	0.535143	0.000

Table 20 reveals that the level of awareness of the respondents for each component of fire protection key area of OHSS is moderately aware. The component the respondent gave the highest score in terms of awareness on fire protection is the work place has fuse/short circuit box that is visible and accessible anytime and is easy to operate with a score of 4.33, while the lowest score is the work place has no power extension cord that is lying around with a score of 4.11.

On the other hand, table 20 also reveals that the degree of compliance of the respondents on each component of fire protection key area of OHSS is somehow compliant only. The component to which the respondents is most compliant is Work place has an installed smoke and fire alarm with a mean score of 3.87. The lowest score is in The work

place has fuse/short circuit box that is visible and accessible anytime and is easy to operate with mean score of 3.69.

Correlation reveals positive relationship, hence and increase in awareness to the different components of fire protection secure an increase to the compliance component. Furthermore, table 20 reveals that all components are statistically different on the level of awareness and degree of compliance because of P value of 0.000 on each component.

Table 21 presents the mean, relationship, and differences of the respondents' level of awareness and degree of compliance on OHSS in terms of the different components of machine, equipment and materials.

Table 21
Significant Relationship and Differences of the Respondents' Level of Awareness and Degree of Compliance on OHSS Machine, Equipment and Materials Components

Statement	Awareness	Compliance	Correlation	P. Value
All materials and instruments are well kept in a specific storage areas/cabinet	4.19	4.07	0.633	0.000
All storage areas and cabinet are properly labelled	4.11	4.01	0.619	0.000
All equipment and machines are turned off and unplug when not in use.	4.32	3.92	0.686	0.000
All equipment and machines are periodically calibrated	4.22	3.93	0.605	0.000
All personnel are properly trained on how to use the equipment and machines	4.61	4.02	0.593	0.000
Instructions on how to operate the equipments and machines are readily available	4.51	3.91	0.634	0.000
All instruments are sterilized using WHO approved sterilization process	4.52	4	0.549	0.000
All equipment are disinfected using WHO approved disinfection process	4.42	4.2	0.634	0.000
general weighted mean	4.3625	4.0075	0.619125	0.000

Table 21 reveals that the level of awareness of the respondents for each component of machine, equipment and materials key area of OHSS is moderately aware. The component the respondent gave the highest score in terms of awareness on machine, equipment and materials is the all personnel are properly trained on how to use the equipment and machines with a score of 4.61, while the lowest score is the All storage areas and cabinet are properly labelled with a score of 4.11.

On the other hand, table 21 also reveals that the degree of compliance of the respondents' on each component of machine, equipment and materials key area of OHSS is somehow compliant only. The component to which the respondents are most compliant is all equipment are disinfected using WHO approved disinfection process with a mean score of 4.2. The lowest score is in the instructions on how to operate the equipment and machines are readily available with mean score of 3.91.

Correlation result reveals positive relationship, hence and increase in awareness to the different components of machine, equipment and materials secure an increase to the compliance component. Furthermore, table 21 shows that all components are statistically different on the level of awareness and degree of compliance because of P value of 0.000 on each component.

Table 22 presents the mean, relationship, and differences of the respondents' level of awareness and degree of compliance on OHSS in terms of the different components of general work environment and housekeeping.

Table 22
Significant Relationship and Differences of the Respondents' Level of Awareness and Degree of Compliance on OHSS General Work Environment and Housekeeping Components

Statement	Awareness	Compliance	Correlation	P. Value
The work place are always clean and tidy	4.52	4.16	0.713	0.000
The work place has no stagnant water that will serve as mosquitoes nest	4.61	4.13	0.719	0.000
The work place is not infested with any pest or insect	4.51	4.02	0.686	0.000
The work place has no foul odor and is properly ventilated	4.52	4.32	0.705	0.000
The work place does not emit stray radiation	4.42	4.14	0.733	0.000
The work place well Lighted	4.69	4.18	0.734	0.000
The work place has installed emergency lighting system	4.53	4.03	0.711	0.000
general weighted mean	4.542857	4.14	0.714429	0.000

Table 22 reveals that the level of awareness of the respondents are for each component of general work environment and housekeeping key area of OHSS is moderately aware. The component the respondents gave the highest score in terms of awareness on general work environment and housekeeping is the work place is well Lighted with a score of 4.69. While the lowest score is the work place does not emit stray radiation with a score of 4.42.

On the other hand, table 22 also reveals that the degree of compliance of the respondents' on each component of general work environment and housekeeping key area of OHSS is somehow compliant only. The component to which the respondents is most compliant is the work place has no foul odor and is properly ventilated with a mean score of

4.32. The lowest score is in the work place is not infested with any pest or insect with mean score of 4.02.

Data of correlation result reveals positive relationship, hence an increase in awareness to the different components of general work environment and housekeeping secure an increase to the compliance component. Furthermore, table 22 showed that all components are statistically different on the level of awareness and degree of compliance because of P value of 0.000 on each component.

Table 23 presents the mean, relationship, and differences of the respondents' level of awareness and degree of compliance on OHSS in terms of the different components of health care waste management.

Table 23
Significant Relationship and Differences of the Respondents' Level of Awareness and Degree of Compliance on OHSS Health Care Waste Management Components

Statement	Awareness	Compliance	Correlation	P. Value
Segregate Waste according to its nature	4.2	3.98	0.734	0.000
Waste containers are appropriately labeled.	4.01	3.37	0.696	0.000
Using Waste Containers that is leaked proofed and met specific performance standards	3.99	3.79	0.733	0.000
Follow the Color coding scheme for waste container	4.1	3.48	0.789	0.000
Uses puncture proof, rigid and impermeable waste containers for sharp waste (e.g needle)	4.11	3.76	0.776	0.000
Uses Bags and containers for infectious waste marked with the international infectious substance symbol	4.2	3.52	0.705	0.000
Immediately treating highly infectious and hazardous waste	3.92	3.45	0.793	0.000
Segregate Radioactive waste according to its physical form in especially marked container prescribed by PNRI.	4.01	3.37	0.734	0.000
Provide appropriate containers or bag holder in all location where particular categories of waste may be generated.	4.1	3.69	0.749	0.000
Store all health care waste collected in a waste storage area until transported to a designated off-site treatment facility	3.93	3.26	0.733	0.000
Marked the Storage Area with warning sign "caution: Bio hazardous waste storage area-unauthorized persons keep out"	3.82	3.12	0.793	0.000
Store the waste in bags or containers in a separate area	3.81	3.45	0.675	0.000
Dispose waste regularly and frequently or within the prescribe 48 hours.	3.93	3.69	0.741	0.000
Seek Affiliation with DOH health care waste Collecting/transporting agency	4.11	3.98	0.793	0.000
Replace bags /container immediately with a new ones of the same type	4.2	3.37	0.734	0.000
Keep an ample supply of waste bag/containers	3.92	3.79	0.749	0.000
Provide and keep consignment note of waste for disposal /transport.	4.01	3.48	0.733	0.000
Follow the Color coding scheme of waste bags	4.1	3.76	0.783	0.000
Uses international symbol for infectious waste	3.93	3.52	0.675	0.000
store waste on a separate facility	3.82	3.45	0.741	0.000
General weighted mean	4.01	3.53	0.742	0.000

Table 23 reveals that the level of awareness of the respondents for each component of health care waste management key area of OHSS is moderately aware. The components that the respondents gave the highest score in terms of awareness health care waste management is "uses puncture proof, rigid and impermeable waste containers for sharp waste" and "seek affiliation with DOH health care waste collecting/transporting agency" both with mean score of 4.11. The lowest score are Marked the Storage Area with warning sign "caution: Bio hazardous waste storage area- unauthorized persons keep out" and store waste on a separate facility with both score of 3.82.

On the other hand, table 23 also reveals that the degree of compliance of the respondents' on each component of health care waste management key area of OHSS is somehow compliant only. The components to which the respondents is most compliant are the "Segregate Waste according to its nature" and "seek affiliation with DOH health care waste Collecting/transporting agency" both with mean score of 3.98. The lowest scores are the "Waste containers are appropriately labeled" and "Replace bags /container immediately with a new ones of the same type" both with mean score of 3.37.

The result of correlation reveals positive relationship, pertains to an increased awareness to the different components of health care waste management allows an increase to the compliance components. Furthermore, table 23 showed that all components are statistically different on the level of awareness and degree of compliance because of P value of 0.000 on each component.

Table 24 presents the mean, relationship, and differences of the respondents' of level of awareness and degree of compliance on OHSS in terms of the different components of employee's protection.

Table 24
Significant Relationship And Differences on the Respondents' Level of Awareness and Degree of Compliance on OHSS Employee's Protection

Statement	Awareness	Compliance	Correlation	P. Value
Personnel are all members of Philhealth	4.18	3.98	0.711	0.000
All employees are wearing protective gears during operation	4.14	3.59	0.713	0.000
Management are providing all the necessary protective gears needed by the employees	4.15	3.56	0.714	0.000
Management constantly provide training to the employees about Occupational health and safety practices	4.17	3.45	0.711	0.000
general weighted mean	4.16	3.645	0.71225	0.000

Table 24 reveals that the level of awareness of the respondents for each component of employee's protection key area of OHSS is moderately aware. The component the respondent gave the highest score in terms of awareness on employee's protection is the Personnel are all members of Philhealth with a score of 4.18. The item that got the lowest score is All employees are wearing protective gears during operation with a score of 4.14.

On the other hand, table 24 also reveals that the degree of compliance of the respondents' on each component of employee's protection key area of OHSS is somehow compliant only. The component to which the respondents is most compliant is the "Personnel are all members of Philhealth" with a mean score of 3.98. The lowest score is in Management constantly provide training to the employees about Occupational health and safety practices with mean score of 3.45.

The result of the correlation test reveals positive relationship, hence and increase in awareness to the different components employee's protection secure an increase to the compliance component. Furthermore, table 24 shows that all components are statistically

different on the level of awareness and degree of compliance because of P value of 0.000 on each component.

Table 25 presents the Analysis of Variance of overall awareness on occupational health and safety standard according to the selected economic growth center.

Table 25
ANOVA on Overall Awareness on Occupational Health and Safety Standard According to the Selected Economic Growth Center

Overall awareness	Sum of square	F	Sig
Between groups	6.982	15.142	0.000
Within group	51.492		
Total	58.398		

An F value of 15.142 and P Value of 0.000 reveals that one of the three economic growth center has a different level of awareness on occupational health and safety standard compare to the other two.

Table 26 presents the Duncan Multiple Range of overall level of awareness on occupational health and safety among selected economic growth center.

Table 26
Duncan Multiple Range of Overall Level of Awareness on Occupational Health and Safety Among the Selected Economic Growth Center

Economic Growth Center	N	Subset for alpha = 0.05	
		1	2
Cebu	68	4.04	
Davao	54	4.08	
NCR	104		4.41
Sig		0.601	1.000

Table 26 reveals that Cebu and Davao belongs to the same subset and NCR is on the second subset. This clearly indicates that NCR has statistically higher awareness when compared to Cebu and Davao that has statistically the same level of overall awareness on occupational health and safety standard.

Table 26 establishes that agencies responsible in promoting high awareness on Occupational health and safety among dental professionals in Cebu and in Davao, must increase their effort to escalate the awareness of dental professionals on OHSS.

Table 27 presents analysis of variance on overall awareness on occupational health and safety standard according to the different dental professions on the selected economic growth centers.

Table 27
ANOVA on Overall Awareness on Occupational Health and Safety Standard According to the Different Dental Profession on Each Selected Economic Growth Center.

Location	Overall awareness	Sum of square	F	Sig
NCR	Between groups	2.055	4.760	0.011
	Within group	21.801		
	Total	23.856		
Cebu	Between groups	0.457	1.000	0.373
	Within group	14.847		
	Total	15.304		
Davao	Between groups	0.804	1.791	0.177
	Within group	11.447		
	Total	12.251		

Table 27 reveals that NCR dental professionals has an F value of 4.760 and P Value of 0.011. This mean that one of the 3 dental professionals from NCR has a statistically different overall level of awareness on occupational health and safety standards.

Furthermore, Table 27 reveals that Cebu and Davao has a P value of 0.373 and 0.177 respectively. This P values are higher than the set alpha level. This indicates that the level of overall awareness on occupational health and safety standard of dental professionals from this economic growth centers are statistically the same.

Table 28 presents the Duncan Multiple Range of Overall Level of Awareness on Occupational Health and safety among Dental Professionals from National Capital Region.

Table 28
Duncan Multiple Range of Overall Level of Awareness on Occupational Health and Safety among Dental Professionals from National Capital Region

Professions	N	Subset for alpha = 0.05	
		1	2
Dental Hygienist	13	4.039	
Dental Lab Tech	21		4.460
Dentist	70		4.465
Sig		1.00	0.976

Table 28 reveals that Dentist and Dental Laboratory Technologist belongs to the same subset and Dental hygienist is on the other subset. This clearly indicates that Dental hygienist has statistically different level awareness when compared to Dentist and Dental Laboratory Technologist that have statistically the same level of overall awareness on occupational health and safety standard.

The result presented in table 28 is actually expected. Dental hygienist will have moderate awareness on OHSS. But among the 3 dental professionals, the dental hygienist will always have the lowest awareness. This is due to dental hygienist basically are only working along with dentist. They do not put up their own clinics which make them a little less aware with OHSS protocol and polices.

Table 29 presents Analysis of Variance of overall degree compliance on occupational health and safety standard according to the age group of the respondents.

Table 29
Analysis of Variance on Overall Degree Compliance on Occupational Health and Safety Standard According to Respondent's Age Group

Overall awareness	Sum of square	F	Sig
Between groups	7.188	2.830	0.017
Within group	110.217		
Total	117.404		

Table 29 reveals an F value of 2.830 and P Value of 0.017 which means that at least 1 age group has significant difference on the overall compliance on occupational health and safety standard.

Table 30 presents the Duncan Multiple Range tabulation on the overall degree of compliance on occupational health and safety standard of the different age groups.

Table 30
Duncan Multiple Range of Overall Degree of Compliance on Occupational Health and Safety Based on the Different Age Group.

Age group	N	Subset for alpha = 0.05	
		1	2
28 and below	85	3.55	
29-33	32	3.78	3.78
34-39	28	3.86	3.86
40-44	39	3.93	3.93
50+	14	3.96	3.96
45-49	25		4.00
Sig		0.056	0.306

Table 30 reveals that there are 2 two subsets revealing two age groups that are significantly different from the others. Age group 28 and below has a statistically low mean score while age group 45-49 has the highest statistically mean score.

Table 31 presents two tailed t-test of overall degree of compliance of the respondents on occupational health and safety standard according to gender.

Table 31
T-Test to Determine Significant Difference on the Overall Degree of Compliance on Occupational Health and Safety Standard According to Gender.

Awareness	F	P (2-tailed)	Significance
Overall Awareness	1.432	0.492	NSD

Table 31 reveals a P value of 0.492 which signifies no significant difference on the overall degree of compliance on occupational health and safety between genders.

Table 32 presents Analysis of Variance of overall degree of compliance on occupational health and safety standard according to the selected economic growth center.

Table 32
ANOVA on Overall Degree of Compliance On Occupational Health and Safety Standard According to the Selected Economic Growth Center

Overall awareness	Sum of square	F	Sig
Between groups	17.355	18.682	0.000
Within group	103.578		
Total	120.933		

Table 32 reveals an F value of 18.682 and P Value of 0.000 which means that one of the three economic growth center has a different degree of compliance on occupational health and safety standard compared with the other two.

Table 33 presents the Duncan Multiple Range of overall degree of compliance on occupational health and safety among selected economic growth center.

Table 33
Duncan Multiple Range of Overall Degree of Compliance to Occupational Health and Safety among the Selected Economic Growth Center

Economic Growth Center	N	Subset for alpha = 0.05	
		1	2
Davao	54	3.45	
Cebu	68	3.57	
NCR	104		4.07
Sig		0.261	1.000

Table 33 reveals that Cebu and Davao belongs to the same subset and NCR is on the second subset. This clearly indicates that NCR has statistically higher degree of compliance when compared to Cebu and Davao that has statistically the same level of overall awareness on occupational health and safety standard.

Moderate compliance is not enough to provide maximum protection against OHSS hazards. A full and complete compliance is must. Table 33 presents a proof that effort to increase compliance of dental professionals on OHSS is now an urgent matter to deal with.

Dental professionals at all cost should be 100% compliant to OHSS to ensure their safety, their health as well as the community.

Table 34 presents analysis of variance on overall degree of compliance on the occupational health and safety standard according to the different dental professions on the selected economic growth centers.

Table 34
ANOVA on overall Degree of Compliance on Occupational health and safety Standard According to the Different Dental Profession on Each Selected Economic Growth Center.

Location	Overall awareness	Sum of square	F	Sig
NCR	Between groups	9.994	12.639	0.000
	Within group	39.931		
	Total	49.926		
Cebu	Between groups	3.796	4.505	0.015
	Within group	27.191		
	Total	30.960		
Davao	Between groups	3.467	4.598	0.015
	Within group	19.226		
	Total	22.692		

Table 34 reveals that NCR dental professionals has an F value of 12.639 and P Value of 0.000. This means that one of the three dental professionals from NCR is statistically different on overall degree of compliance on occupational health and safety standards.

Furthermore, Table 34 reveals that Cebu and Davao both has a P value of 0.015. This P value is higher than the set alpha level. This indicate that at least one dental professionals from both Cebu and Davao is statistically different compared with the other dental professionals.

Table 35 presents the Duncan Multiple Range tabulation of the overall degree of compliance on occupational health and safety among dental professionals from National Capital Region.

Table 35
Duncan Multiple Range of Overall Degree of Compliance on Occupational Health and safety among Dental Professionals from National Capital Region

Professions	N	Subset for alpha = 0.05	
		1	2
Dental Hygienist	13	3.29	
Dentist	70		4.12
Dental Lab Tech	21		4.37
Sig		1.000	0.188

Table 35 reveals that the overall compliance of dentist and dental technologist is statistically the same which include them both in the same subset. However, Dental hygienist is separated into a different subset, because their degree of compliance on occupational health and safety standard is significantly different from dentist and dental lab technologist.

Table 36 presents the Duncan Multiple Range tabulation of the overall degree of compliance on occupational health and safety among dental professionals from Cebu.

Table 36
Duncan Multiple Range of Overall Degree of Compliance on Occupational Health and Safety Among Dental Professionals From Cebu

Professions	N	Subset for alpha = 0.05	
		1	2
Dental Hygienist	10	3.11	
Dental Lab Tech	11	3.36	3.36
Dentist	47		3.73
Sig		0.311	0.134

Table 36 reveals that the overall compliance of dental lab technician and dental hygienist is statistically the same when compared, which include them both in the same subset. However, Dental lab tech is also statistically the same with dentist. However, Dentist and Dental hygienist degree of compliance on occupational health and safety standard is statistically different.

Table 37 presents the Duncan Multiple Range tabulation of the overall degree of compliance on occupational health and safety among dental professionals from Davao.

Table 37
Duncan Multiple Range of Overall Degree of Compliance on Occupational Health and Safety Among Dental Professionals from Davao

Professions	N	Subset for alpha = 0.05	
		1	2
Dental Lab Tech	32	3.34	
Dentist	16	3.39	
Dental Hygienist	6		4.16
Sig		0.862	1.000

Table 37 reveals that the overall compliance of dentist and dental technologist is statistically the same which include them both in the same subset. However, Dental hygienist is separated into a different subset because their degree of compliance on occupational health and safety standard is significantly different from dentist and dental lab technologist. Apparently, the degree of compliance on occupational health and safety standard of dental hygienist is statistically higher compared to the dental lab technician and dentist.

VI The Derived Occupational Health and Safety Model for Dental Professionals:

As a result of the study, a model for occupational health and safety for dental professionals terms of awareness and compliance to OHSS key areas: general safety and health, work place, exit and access, fire protection, general work environment and

housekeeping, machine, equipment and materials, health care waste management, and employees' protection was derived through regression analysis. The derived model is presented in the form of regression equation and tables. The model is presented first with the multiple correlation result of the seven key areas of OHSS on awareness.

The second presentation is the multiple correlation result of the seven key areas of OHSS on compliance. The third presentation shows the congruent contribution of awareness and compliance to OHSS based on the derived regression equation. The fourth presentation is tabulated contingency model of awareness and compliance per key areas of OHSS. All that is marked X in both column is considered strength. Components which are marked X in either of the two columns are considered weaknesses and need corrective actions. Components that are not marked X on any column are not predictors of OHSS.

1. For the multiple correlation of the seven key areas of OHSS on awareness

Table 38 presents the multiple correlation analysis result of components of the seven key areas on awareness.

Table38
Multiple Correlation Results of Components of the Seven Key Areas on Awareness

Key areas	Multiple R	R Square	Coefficient (y)	adjustment
General Safety and Health	0.250	0.062	2.795	0.307
Work place, exit and access	0.341	0.116	2.849	0.307
Fire protection	0.234	0.055	3.080	0.257
Machine, equipment, materials	0.238	0.056	3.463	0.197
Environment and Housekeeping	0.336	0.113	2.280	0.409
Healthcare waste management	0.235	0.055	2.999	0.222
Employees' Protection	0.358	0.128	2.274	0.403
total		0.585		

Table 38 reveals that all components of the seven key areas of OHSS on awareness has a positive multiple R value signifying positive relationship. Table 38 also presents the r square value for each of the seven key areas of OHSS on awareness. General safety and health has r square value of 0.062 that means, components of the general health and safety is only 6% of the OHSS general health and safety key area. Furthermore, for every unit increase in the OHSS general health and safety area, a corresponding 0.307 unit of increase is evident in the awareness.

Work place exit and access has r square value of 0.116 that means, components of the Work place exit and access is almost 12% of the OHSS Work place exit and access key area. Furthermore, for every unit increase in the OHSS Work place exit and access area, a corresponding 0.307 unit of increase is evident in the awareness.

Fire protection has r square value of 0.055 that means, components of the Fire protection is almost 6% of the OHSS Fire protection key area. Furthermore, for every unit increase in the OHSS Fire protection area, a corresponding 0.257 unit of increase is evident in the awareness.

Table 38 also reveals that machine, equipment and materials has r square value of 0.056 that means, components of the machine, equipment and materials is almost 6% of the OHSS machine, equipment and materials key area. Furthermore, for every unit increase in the OHSS machine, equipment and materials area, a corresponding 0.197 unit of increase is evident in the awareness.

Environment and housekeeping has computed r square value of 0.113 which means that components of environment and housekeeping is 11% of the OHSS environment and housekeeping key area. Moreover, for every unit increase in the OHSS Environment and housekeeping area, a corresponding 0.409 unit of increase is evident in the awareness.

Healthcare waste management has computed r square value of 0.055 which means that components of Healthcare waste management is 6% of the OHSS Healthcare waste management key area. Moreover, for every unit increase in the OHSS Healthcare waste management area, a corresponding 0.222 unit of increase is evident in the awareness.

Employees' protection has computed r square value of 0.128 which means that components of Employees' protection is 13% of the OHSS Employees' protection key area. Moreover, for every unit increase in the OHSS Employees' protection area, a corresponding 0.403 unit of increase is evident in the awareness.

All in all, table 38 reveals that all combined components of the OHSS seven key areas on awareness contribute to 58.5% of OHSS awareness in general. The other 41.5% could be due to other factors that were not included in this study.

2. For the multiple correlation of the seven key areas of OHSS on compliance

Table 39 presents the multiple correlation analysis result of components of the seven key areas on compliance.

Table39
Multiple Correlation Results of Components of the Seven Key Areas on Compliance

Key areas	Multiple R	R Square	Coefficient (y)	adjustment
General Safety and Health	0.318	0.101	1.101	0.567
Work place, exit and access	0.451	0.203	1.376	0.542
Fire protection	0.156	0.024	2.812	0.210
Machine, equipment, materials	0.345	0.119	2.180	0.398
Environment and Housekeeping	0.235	0.055	3.710	0.182
Healthcare waste management	0.347	0.120	1.597	0.425
Employees' Protection	0.193	0.032	2.282	0.291
total		0.654		

Table 39 reveals that all components of the seven key areas of OHSS on compliance have a positive multiple R value signifying positive relationship. Table 39 also presents the

r square value for each of the seven key areas of OHSS on compliance. General safety and health compliance has r square value of 0.101 that means, components of the general health and safety compliance is 10% of the OHSS general health and safety key area. Furthermore, for every unit increase in the OHSS general health and safety area, a corresponding 0.567 unit of increase is evident in the compliance.

Work place exit and access has r square value of 0.203 that means, components of the Work place exit and access compliance is almost 20% of the OHSS Work place exit and access key area. Furthermore, for every unit increase in the OHSS Work place exit and access area, a corresponding 0.547 unit of increase is evident in the compliance.

Fire protection has r square value of 0.024 that means, components of the Fire protection compliance is almost 2% of the OHSS Fire protection key area. Furthermore, for every unit increase in the OHSS Fire protection area, a corresponding 0.210 unit of increase is evident in the compliance.

Table 39 also reveals that machine, equipment and materials has r square value of 0.119 that means, components of the machine, equipment and materials compliance is 11% of the OHSS machine, equipment and materials key area. Furthermore, for every unit increase in the OHSS machine, equipment and materials area, a corresponding 0.398 unit of increase is evident in the compliance.

Environment and housekeeping has computed r square value of 0.055 which means that components of environment and housekeeping is 5% of the OHSS environment and housekeeping key area. Moreover, for every unit increase in the OHSS Environment and housekeeping area, a corresponding 0.182 unit of increase is evident in the compliance.

Healthcare waste management has computed r square value of 0.120 which means that components of Healthcare waste management is 12% of the OHSS Healthcare waste management key area. Moreover, for every unit increase in the OHSS Healthcare waste management area, a corresponding 0.425 unit of increase is evident in the compliance.

Employees' protection has computed r square value of 0.032 which means that components of Employees' protection compliance is 3% of the OHSS Employees' protection key area. Moreover, for every unit increase in the OHSS Employees' protection area, a corresponding 0.291 unit of increase is evident in the compliance.

All in all, table 39 reveals that all combined components of the OHSS seven key areas on compliance contribute to 65.4% of OHSS compliance in general. The missing 34.6% could be because of other factors that were not included in this study.

3. Congruence of Awareness and Compliance of the Different OHSS Key Areas.

Table 40 presents the multiple correlation analysis result of components of the seven key areas on awareness and compliance congruency.

Table 40
Summary of Multiple Correlation Results of Components of the Seven Key Areas on Congruency of Awareness and Compliance

Key areas	Multiple R	R Square	Coefficient (y)	Awareness	Compliance
General Safety and Health	0.329	0.108	3.912	0.084	0.145
Work place, exit and access	0.451	0.204	2.943	0.037	0.355
Fire protection	0.237	0.056	3.679	0.193	0.031
Machine, equipment, materials	0.189	0.039	3.891	0.060	0.119
Environment and Housekeeping	0.336	0.113	3.437	0.010	0.280
Healthcare waste management	0.349	0.121	3.659	0.055	0.315
Employees' Protection	0.370	0.136	3.323	0.085	0.400
total		0.777			

Table 40 reveals that all key areas of OHSS has a positive value signifying positive relationship of awareness and compliance to the realization of OHSS.

A. General safety and health R square value of 0.108. It means that awareness and compliance on OHSS general safety and health contribute 10% to the total OHSS.

Congruent of awareness and compliance on OHSS general safety and health regression equation is as follow:

OHSS = GSH + A , + C

OHSS = 3.912 + 0.084, + 0.145

Where

OHSS	is occupational health and safety
GSH	is general safety and health
A	awareness
C	compliance

For every unit increase in the OHSS a whole, a relevant increase of 0.084 on the awareness and 0.145 on compliance.

B. Work place, exit and access R square value of 0.204. It means that awareness and compliance on OHSS Work place, exit and access contribute 20% to the total OHSS.

Congruent of awareness and compliance on OHSS Work place, exit and access regression equation is as follow:

OHSS = WEA + A , + C

OHSS = 2.943 + 0.084, + 0.145

Where

OHSS	is occupational health and safety
WEA	is Work place, exit and access
A	awareness
C	compliance

For every unit increase in the OHSS a whole, a relevant increase of 0.037 on the awareness and 0.355 on compliance.

C. Fire protection R square value of 0.056. It means that awareness and compliance on OHSS Fire protection contribute 5.6% to the total OHSS.

Congruent of awareness and compliance on OHSS Fire protection regression equation is as follow:

OHSS = FP + A , + C

OHSS = 3.679 + 0.193, + 0.031

Where

OHSS	is occupational health and safety
FP	is Work place, exit and access
A	awareness
C	compliance

For every unit increase in the OHSS a whole, a relevant increase of 0.193 on the awareness and 0. 031 on compliance.

D. Machine, equipment and materials R square value of 0.039. It means that awareness and compliance on OHSS Machine, equipment and materials contribute 3.9% to the total OHSS.

Congruent of awareness and compliance on OHSS Machine, equipment and materials regression equation is as follow:

OHSS = MEM + A , + C

OHSS = 3.891 + 0.060, + 0.119

Where

OHSS	is occupational health and safety
MEM	is Machine, equipment and materials
A	awareness
C	compliance

For every unit increase in the OHSS a whole, a relevant increase of 0.060 on the awareness and 0. 119 on compliance.

E. General work environment and Housekeeping R square value of 0.113. It means that awareness and compliance on OHSS General work environment and Housekeeping contribute 11.3% to the total OHSS.

Congruent of awareness and compliance on OHSS General work environment and Housekeeping regression equation is as follow:

OHSS = GWEH+ A , + C

OHSS = 3.437 + 0.010, + 0.280

Where

OHSS	is occupational health and safety
GWEH	is General work environment and Housekeeping
A	awareness
C	compliance

For every unit increase in the OHSS a whole, a relevant increase of 0.010 on the awareness and 0.280 on compliance.

F. Healthcare waste management R square value of 0.121. It means that awareness and compliance on OHSS Healthcare waste management contribute 12.1% to the total OHSS.

Congruent of awareness and compliance on OHSS Healthcare waste management regression equation is as follow:

OHSS = HWM + A , + C

OHSS = 3.659 + 0.055, + 0.315

Where

OHSS	is occupational health and safety

HWM	is Healthcare waste management
A	awareness
C	compliance

For every unit increase in the OHSS a whole, a relevant increase of 0.055on the awareness and 0.315 on compliance.

G. Employees' Protection R square value of 0.136. It means that awareness and compliance on OHSS Employees' Protection contribute 13.6% to the total OHSS.

Congruent of awareness and compliance on OHSS Employees' Protection regression equation is as follow:

OHSS = EP + A , + C

OHSS = 3.323 + 0.085, + 0.400

Where

OHSS	is occupational health and safety
EP	is Employees' Protection
A	awareness
C	compliance

For every unit increase in the OHSS a whole, a relevant increase of 0. 085 on the awareness and 0.400 on compliance.

With all of these regression equation, it was found out that 77.7% of the total OHSS practices is a congruent of awareness and compliance. The remaining 22.3% may be due to other factors not included in this study.

4. Contingency models of the different OHSS key areas and its components

All that is marked X in both column is considered strength. Components which are marked X in either of the two columns are considered weakness and needed

corrective action. However, all components that are not marked X on any columns are not predictors of OHSS

Table 41
Contingency Model on General Safety and Health

Statement	Awareness	Compliance
Hospital should be within 5 Kilometre from the workplace or is accessible within 25 minutes.	x	x
Transportation can be provided in case of emergency.	x	x
Work place is free from hazards that are likely to cause physical harm to the workers, patients and guests.	x	x
Substituting a non-toxic biodegradable cleaner for a hazardous chemical cleaner.	x	x
Reuse product over and over again for a given function as intended	x	x
Select reusable rather than disposable products whenever possible	x	x
Set reliable standards for disinfection and sterilization of equipment and materials for use	x	x
Practice Recycling	x	x
Practice Waste Segregation	x	x

Table 42
Contingency Model on OHSS Workplace, Exit and Access Components

Statement	Awareness	Compliance
The work place is properly ventilated	x	x
The work place has flat and leveled flooring	x	x
The work place has enough height ceiling distance from the floor	x	x
The work place is provided with clean and well maintained lavatory and toilet.	x	x
The door can facilitate exit and entry of PWD in a wheel chair	x	
The work place installed signages of the emegergency exit direction and location	x	
The work place exits are not blocked.	x	
The Work place exits can be easily open from the inside.	x	x
The work place has a displayed evacuation plan in all corners.	x	x
The work stations has enough distance from each other.	x	x
The work place emergency exits cannot be opened from the outside	x	x
The work place has stocks of survival kits and first aid kits	x	x
The work place is in far proximity from establishment that emits radiation	x	x
the work place has no exposed plumbing from on the floor	x	x

Table 43
Contingency Model of OHSS Fire Protection

Statement	Awareness	Compliance
The work place has a Fire and protection clearance from the Bureau of Fire and Protection.	x	x
The work place has enough power outlet	x	x
The work place has no power extension cord that is lying around	x	x
The work place has its own Fire extinguisher	x	x
The work place has an installed Water sprinkler system	x	x
Work place has an installed smoke and fire alarm	x	x
The work place has fuse/short circuit box that is visible and accessible anytime and is easy to operate	x	x

Table 44
Contingency Model of OHSS Machine, Equipment and Materials Components

Statement	Awareness	Compliance
All materials and instruments are well kept in a specific storage areas/cabinet	x	x
All storage areas and cabinet are properly labelled	x	
All equipment and machines are turned off and unplug when not in use.	x	x
All equipment and machines are periodically calibrated	x	x
All personnel are properly trained on how to use the equipment and machines	x	
Instructions on how to operate the equipments and machines are readily available	x	
All instruments are sterilized using WHO approved sterilization process	x	x
All equipment are disinfected using WHO approved disinfection process	x	x

Table 45
Contingency Model of OHSS General Work Environment and Housekeeping Components

Statement	Awareness	Compliance
The work place are always clean and tidy	x	x
The work place has no stagnant water that will serve as mosquitoes nest	x	x
The work place is not infested with any pest or insect	x	x
The work place has no foul odor and is properly ventilated	x	x
The work place does not emit stray radiation	x	x
The work place well Lighted	x	x
The work place has installed emergency lighting system	x	

Table 46
Contingency model of OHSS Healthcare Waste Management Components

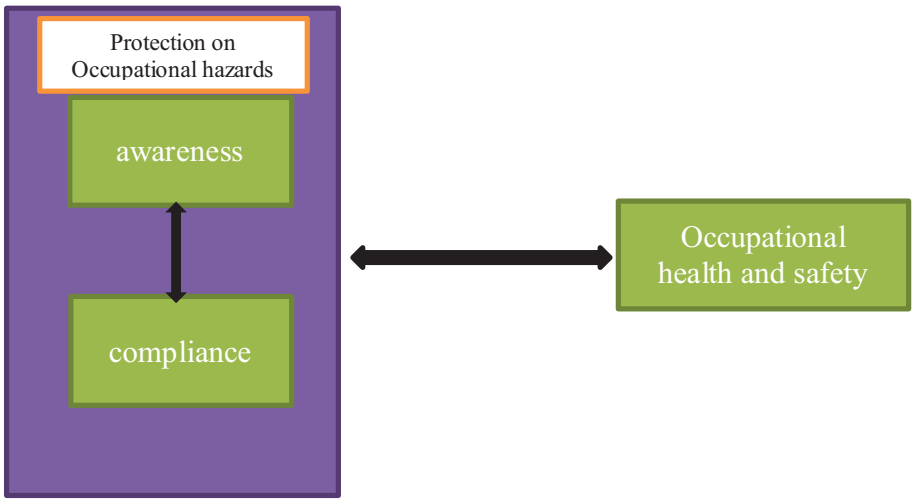
Statement	Awareness	Compliance
Segregate Waste according to its nature	x	x
Waste containers are appropriately labeled.		
Using Waste Containers that is leaked proofed and met specific performance standards	x	x
Follow the Color coding scheme for waste container	x	
Uses puncture proof, rigid and impermeable waste containers for sharp waste (e.g needle)	x	x
Uses Bags and containers for infectious waste marked with the international infectious substance symbol	x	x
Immediately treating highly infectious and hazardous waste		
Segregate Radioactive waste according to its physical form in especially marked container prescribed by PNRI.	x	
Provide appropriate containers or bag holder in all location where particular categories of waste may be generated.	x	x
Store all health care waste collected in a waste storage area until transported to a designated off-site treatment facility	x	
Marked the Storage Area with warning sign "caution: Bio hazardous waste storage area- unauthorized persons keep out"	x	
Store the waste in bags or containers in a separate area	x	
Dispose waste regularly and frequently or within the prescribe 48 hours.	x	x
Seek Affiliation with DOH health care waste Collecting/transporting agency	x	
Replace bags /container immediately with a new ones of the same type	x	
Keep an ample supply of waste bag/containers	x	x
Provide and keep consignment note of waste for disposal /transport.	x	
Follow the Color coding scheme of waste bags	x	x
Uses international symbol for infectious waste	x	x
store waste on a separate facility		

Table 47
Contingency Model of OHSS Employee's Protection

Statement	Awareness	Compliance
Personnel are all members of Philhealth	x	x
All employees are wearing protective gears during operation	x	x
Management are providing all the necessary protective gears needed by the employees	x	x
Management constantly provide training to the employees about Occupational health and safety practices	x	

Consolidated Summary Model

The consolidated summary model for Occupational Health and safety model for dental professionals is shown below:



The Derived OHSS Model for Dental Professionals

The model shows a congruency between two constituents of occupational health and safety, namely, awareness and compliance to be able to obtain maximum protection against occupational hazards.

The overall contingency model that follows presents the specific components on OHSS level of awareness and degree of compliance on tracks that give significant impact to the overall OHSS.

A Proposed Occupational Health and Safety Standard Policy for Dental Professionals

By: Brian E. Esporlas DMD, MSD, FPFA

Objectives:

1. To Increase Awareness and compliance of Dental Professionals on the occupational health and safety standard.
2. To ensure maximum health protection for both Dental Professionals and the community against Dental occupational health hazards.
3. Upgrade the capability of governing bodies to prevent, eliminate or diminish dental work-related injuries, illnesses and deaths; to inhibit economic losses in terms of man-hours, destruction of property and expenditure for employee's compensation, as well as social cost related to the suffering of victims of dental related accidents or outbreaks of occupational diseases and their families
4. **I**mplement effectively occupational health and safety programs that will promote the health, efficiency and general well-being of the Filipino dental professionals through the amendment of the quality of their working life that will enhance significantly the productivity of dental health care salient element in the attainment of national development goals.

I Raising Awareness on Occupational Health and Safety Standard

1. Dentistry Curriculum Revision

   The Commission on Higher Education and the Philippine Council of Dental Colleges should incorporate the following subject matters:

   1.1. Infection control (includes dental waste management, preventive and post exposure vaccination)

   1.2. Dental Ergonomics as part of the existing Dental practice management course.

2. Local Dental Chapters and Affiliates must require the following before approval and renewal of membership:

2.2. Annual Seminar on the following (In colaboration with the Local Government Unit and Occupational health and Safety Center)

2.2.1. Building code

2.2.2. Infection control

2.2.3. Waste Management

2.2.4. Ergonomics

2.2.5. Fire Protection

2.2.6. Radiation Safety Protocol.

2.2.6. Basic life support and Advance cardiac life support

II Raising Compliance on Occupational Health and Safety Standard

1. Dental Colleges Admission Policy

1.1. Dental colleges should mandate the following:

1.1.1. Mandatory screening for HIV, Hepatitis, and other blood borne infectious diseases (Under government hospitals only)

1.1.2. Requires titer counting and preventive vaccination of the following prior to Admission (under government hospitals only):

1.1.2.1 Hepatitis

1.1.2.2 Tetanus

1.1..2.3 Influenza

1.1.2.4 Others

1.2.3. Dental Colleges should draft a policy on Post Exposure Management

All incident that involves possible exposure to infectious disease (e.g needle pricking and others) must be reported and file. All staff and students must receive a post exposure vaccination and a follow up check-up after a few weeks.

2. National Local Dental Chapters should ensure full implementation of Dental Occupational Health and Safety.

2.1.The National and Local dental chapters and affiliates must

2.1.2 Coordinate with the Occupational Health and Safety Center to ensure proper training, facilities and access of dental professional to dental occupational health and safety in terms:

2.1.2.1. Health Care Waste Management

2.1.2.2. Radiation Safety

2.1.2.3. Fire Protection

2.1.2.4. Emergency Transportation System

3. The Professional Regulation Commission should:

3.1 Accept registration and renewal of license only of professionals with the following:

3.1.1. Updated Membership of Local chapter and affiliates

3.1.2. Heath Certification with no active infectious disease process (certificate issued a government physician from a government hospital)

4.1.3. Health Certification of complete and updated vaccination.(certificate issued a government physician from a government hospital)

4.1.4. Fit to work certification from a government physician

4.1.5. Updated Philhealth and SSS contribution.

4. The Local Government Unit should only approve or renew the PTR and Permit to operate of the professional with the following:

4.1. Updated membership with local dental chapters and affiliates

4.2. Updated PRC license

4.3. Updated, approved clinic/office lay out, with proper illumination, ventilation and emergency exits and evacuation plan and accommodation for patients with disabilities. (Subject for revaluation every after 5 years.)

4.3.1. Certification of approval must be made by local city engineers

4.4. Updated Calibration and Periodic Maintenance Certification of Dental equipment and Devices

4.4.1. 1 year validity only. Periodic calibration and maintenance of dental equipment and devices.

4.4.2. Certificate of Calibration must be provided by the manufacturer or of the local distributors.

4.5. Updated Certification of No Pest Infestation of the Dental office and Laboratory (1 year validity)

4.6. Updated Certification of compliance to building and Fire code

4.6.1. Provided by the building administrators or of the city engineers.

Compliance Policy

1. The different agency must conduct an unscheduled visit to each dental office, clinics and laboratory to ensure compliance.
2. The different agency can recommend sanctions for those dental professionals who will be caught not complying on the occupational health and safety standard.

2.1.Sanctions

2.1.1. First offense

2.1.1.1.Written Warning.

The dental professional must report and comply within 3 days

2.1.2. Second offense

2.1.2.1. 1 month suspension of Permit to operate and a fine of not less than 50,000 pesos but not more than 150,000 pesos.

2.1.2.2.1 month suspension of Professional License

2.1.2.3.The dental professional must report and comply within 3 days.

2.1.3. Third offense

2.1.3.1.3 years suspension of permit to Operate or a fine of not less than 200,000 pesos but not more than 400,000 pesos.

2.1.3.2.6 months of suspension of Professional License.

3. The different agencies may collect minimum processing fee of not less than 100 pesos but not more than 300 pesos.

3.1. For the Dental Association

3.1.1. An increase of 200 pesos for the annual membership fee is sufficient to raise fund for the annual Occupational health and safety standard seminar, training and conference.

3.2.For the Professional Regulation Commission

3.2.1. An increase of 100 pesos for the 3 year License registration and renewal is sufficient to finance annual occupational health and safety standard training for dental professionals, and to finance year round awareness and compliance campaign for occupational health and safety practices.

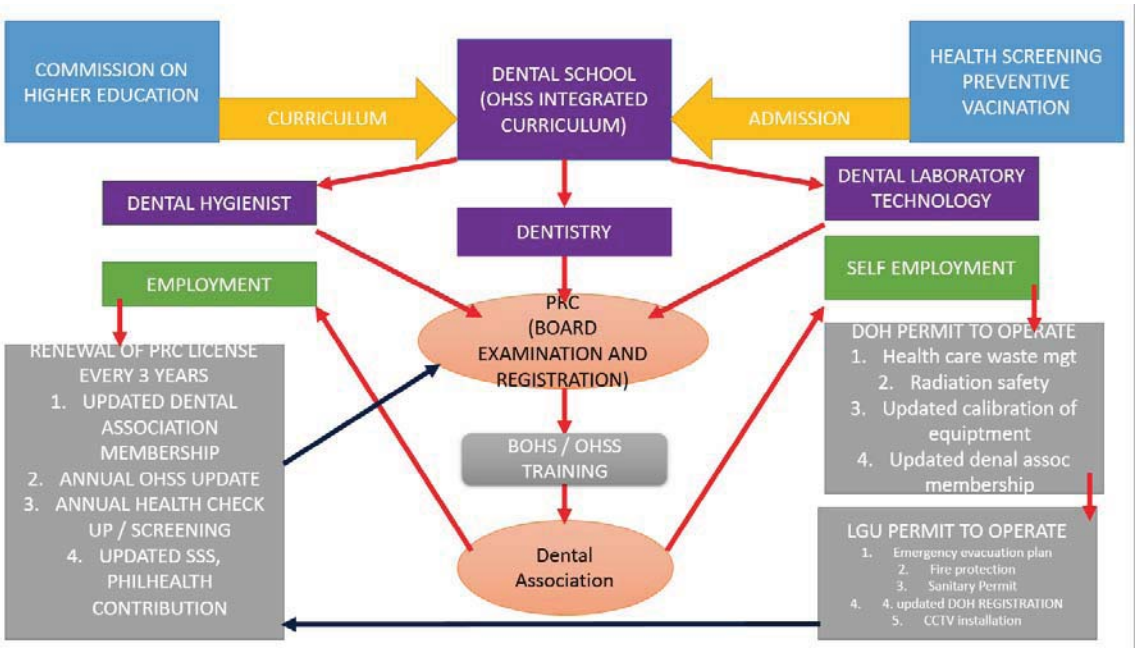


Fig 3
Proposed Algorithm of OHSS for Dental Professionals

CHAPTER 5

Summary, Conclusion and Recommendations

This chapter presents the results of the study according on the findings. The general aim of this research was to develop a standard occupational health and safety for Dental Professionals.

Specifically, the study aimed to seek answers to the following questions:

7. What is the demographic profiles of the respondents in terms of:
   e. Age,
   f. Gender,
   g. Profession, and
   h. Location of practice?
8. What is the level of awareness of the respondents' on occupational health and Safety standard in terms of the following variables:
   h. General Work Environment and Housekeeping,
   i. General safety and Health,
   j. Work place, Exit and Access,
   k. Fire protection,
   l. Machine, equipment and materials,
   m. Healthcare waste management, and
   n. Employee's protection?
9. What is the degree of compliance of the respondents' on occupational health and safety standard in terms of the following variables:
   h. General Work Environment and Housekeeping,
   i. General safety and Health,
   j. Work place, Exit and Access,
   k. Fire protection,
   l. Machine, equipment and materials,
   m. Healthcare waste management, and

n. Employee's protection?

10. What significant relationships exist in the respondents' level awareness and degree of compliance on occupational health and safety standard?
11. What significant differences exist in the respondents' awareness and compliance on occupational health and safety standard when they are group according to the profile of the variables?
12. Based on the findings, what enhanced occupational health and safety standard model can be proposed for dental professionals?

Summary of Findings

The gathered data were presented according to the problems stated in Chapter 1.

1. **The Demographic Profile of the Respondents**.

1.1 Age of the respondents

The respondents are divided into seven age group: 22 and below, 23-28, 29-33, 34-39, 40-44, 45-49, and 50 and above. Most of the respondents belong to age group 23-28. This shows that most of the respondents are relatively young.

1.2 Gender of the respondents

Majority of the respondents are female. 58% of the total respondents are female and male are 42% only.

1.3 Profession of the respondents

There are 3 dental professionals that participated in the study. One hundred thirty three dentist, 64 dental laboratory technology, and 29 dental hygienist.

Of the 133 dentist, 70 are from NCR, 47 are from Cebu and 16 from Davao. From the 64 dental laboratory technician, 32 are from Davao, 21 from NCR, and 11 from Cebu. Dental hygienist from NCR are 13, 10 from Cebu and 6 from Davao.

1.4 Location of Practice

Most of the respondents are practicing in National Capital Region.

2. **Level of Awareness of the Respondents' on Occupational Health and Safety**:

The level of awareness of the respondents on occupational health and safety standard is moderately aware having a score of within the range of 3.81 to 4.80. Considering the respondents' profession, all received score within the range of 3.81 to 4.80 making each group of the respondents according to profession moderately aware on the occupational health and safety standard.

If each key areas of the occupational health and safety standard will be considered, all respondents are still tagged as moderately aware. However, based on the individual group score, the dental hygienist has the lowest score and the dentist has the highest score.

In Addition, if profile of the respondents were considered, it was revealed that age and gender does not affect the awareness. However, based on the findings, location affects the level of awareness. The study revealed that NCR has the highest score of awareness on occupational health and safety standard. While Cebu and Davao has a statistically the same level of awareness. Furthermore, it was revealed by the study that profession significantly affects the level of awareness. NCR dentist and dental laboratory technician posed a significantly the same high level of awareness on occupational health and safety standard compared to the dental hygienist.

3. **Degree of Compliance of the Respondents' on Occupational Health and Safety**:

The overall compliance of the dental professional on the occupational health and safety standard is somehow compliant.

However, when the respondents are group according to profession, the dentist received the highest compliance score and categorized them under moderately compliant. While dental hygienist and dental laboratory technician are still tagged as somehow compliant.

When the profile of the respondents are considered to test the degree of compliance on occupational health and safety standard, it was found out that age, profession and location significantly affects the degree of compliance. It was also found out that gender is insignificant to the degree of compliance.

Compliance is affected by profession. It was revealed that in NCR dentist and dental laboratory technician has these same level of compliance and is significantly higher compare to dental hygienist. On the other hand, dentist and dental laboratory technician from Cebu has statistically the same level of compliance and higher when compare to dental laboratory technician and dental hygienist. Lastly, it was revealed that the level of compliance of dental hygienist in Davao is significantly higher than that of the dentist and dental laboratory technician.

Compliance is also affected by location. It was found out that NCR has the highest compliance score. Cebu and Davao has statistically the same level of compliance.

4. **Relationship of the Respondents' Level of Awareness and Degree of Compliance on the Occupational Health and Safety Standard.**

A strong positive relationship is evident for the level of awareness and the degree of compliance on the different key areas of the occupational health and safety standard of the respondents. Hence, an increase on the level of awareness pertains to an increase on the degree of compliance.

When the profile (age, gender, profession and location) of the respondents are considered, the same strong positive relationship on Level of awareness and degree of compliance on occupational health and safety standard is evident.

5. **Difference on the Level of Awareness And Degree of Compliance of The Respondents to the Occupational Health and Safety Standard**.

Statistics data revealed that mean score of the respondents on the level of awareness on occupational health and safety is significantly higher compare to the mean score of the degree of compliance. Because of this scenario, statistic revealed that there are a significant difference between the respondents' level of awareness and degree of compliance on occupational health and safety standard.

When the profile of the variable was considered, it was found out the age gender, location and profession posed a significantly higher awareness than the compliance. In the end, based on the different profile of the respondents, there is significant difference between their awareness and compliance.

6. The Derived model

The awareness and compliance is congruent that greatly affects occupational health and safety.

Conclusion

The following conclusions were drawn in the revelation of the findings:

3. The study rejected the null hypothesis that there is no significant relationship in the respondent's level of awareness and degree of compliance on the Occupational Health and Safety standards.

A strong and positive relationship was observed on the respondents' level of awareness and degree of compliance on the occupational health and safety standard. An increase to the level of awareness warrant an increase to the degree of compliance. Therefore, it is safe to conclude that awareness play a vital role on the degree of compliance regardless of age, gender, location and profession.

4. The study rejected the null hypothesis that there is no significant difference in the respondent's level of awareness and degree of compliance on the Occupational Health and Safety standards.

The study revealed that the respondents' level of awareness on the occupational health and safety standard is significantly higher to the degree of compliance. Statistical treatment further revealed that there is in fact a significant difference on the level of awareness and degree of compliance of the respondents on the occupational health and safety standard.

Recommendations

Based on the findings and conclusions derived from the gathered data of this study, the following recommendations are hereby given:

1. For the National and Local Dental Association and Affiliates
   1.1. National and local Dental Association and affiliates should draft a policy that would increase awareness and compliance of all dental professionals. It must be in collaboration with other agency such as DOH, PRC, and the Local Government Unit.
   1.2. The National and Local Dental Association and Affiliates must inculcate occupational health and safety to its member by sponsoring a regular scientific session and or conference pertaining to occupational health and safety
2. For the Department of Health, PRC and Local Government Unit
   2.1. The Department of Health must mandate their members to secure Occupational Health and Safety Standard Training prior to issuance of permit to operate.
   2.2. For the Professional Regulation Commission

        PRC should draft a policy that would only allow dental professional to register and renew their license if they complied with the occupational health and safety standard drafted by the Dental Association and the Department of Health.
   2.3. For the Local Government Unit

        The Local Government Unit should make a policy that they will only allow a dental professional to put up his own office or laboratory if the dental

professional is compliant with the provision drafted by the Dental Association, Department of Health and Professional Regulation Commission.

The local government unit should also draft a policy in terms of infrastructure and electrical specific for dental practice.

3. Dental Colleges

Dental colleges should revised their curriculum and include and give more emphasis on the occupational health and safety standard.

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APPENDIX I
CURRICULUM VITAE

Unit 828 Cityland Pasong Tamo Condominium Calle Estacion Makati City

Besporlasdmd@gmail.com Mobile # 0922-8116495

Curriculum Vitae

I. PERSONAL

Name:	**Date of Birth:** November 8, 1981
DR. BRIAN E. ESPORLAS	**Citizenship:** Filipino
	Religious Sect. Roman Catholic
Civil Status: Married	**Institution:** UPHSD Asst. Professor 3
	Institution: Fabro-Esporlas Dental Clinic : Head dentist

II. ACADEMIC AND PROFESSIONAL PREPARATION

1. Undergraduate:

Institution	Degree Earned	Date	Specialization
Centro Escolar University Manila	Doctor of Dental Medicine	March 2004	Gen. Dentistry
Universal Colleges of Paranaque	Teaching Certifaction Program	March 2016	Biological Science

2. Graduate:

Institution	Degree Earned	Date	Specialization
Centro Escolar University	Master of Science in Dentistry	March 2012	Orthodontics

3. Research/Publication/Articles (after the title, write the date and name of publication)

1. Average Upper Lip Length, Nasolabial, and Mentolabial Angle Among Selcted Filipinos With Harmonious Facial Profiles
BIOMEDICAL SCIENCE AND OPERATIONAL RESEARCH VOL 5 NO. 1

2. Upper and Lower Pharyngeal width among Filipino with skeletal and Dental relationship.
Poster board Association Philippine Orthodontist 2010

3. Correction of Mandibular Lateral Deviation Using Loop Mechanics.
Poster board Association Philippine Orthodontist 2011

4.Standard Mesh Diagram for Filipino.

Master's Thesis / Poster Board Hong kong International Dental Expo and Symposium August 2014

5. Level of Compliance of Dentist from 1st District of Makati in terms of DOH health care waste Management.
POSTER BOARD Hong kong International Dental Expo and Symposium August 2015

6. Standard Cephalometric Values of Lower Soft Tissue Profile of Selected Filipinos.
Poster Board Hong kong International Dental Expo and Symposium August 2015

7. Management of Temporo-Mandibular Pain of Muscular in Origin Using KinesioTape Principle.
Poster board. 4th Asian Congress for Temporomandibular joint. Solaire Philippines Nov. 2015

8. Level of Awareness of UPHSD Dental Clinician on Ergonomics on preventing Musculoskeltal Disorders.
Poster board. 4th Asian Congress for Temporomandibular joint. Solaire Philippines Nov. 2015

9. Temporomandibular disorder management of muscle imbalance with condyle derangement: a case report :
Poster board. 4th Asian Congress for Temporomandibular joint. Solaire Philippines Nov. 2015

10. Standard Cephalometric Norms of Craniofacial and Airway Morphology for Filipinos.

Denstiste Official Publication of the College of Dentistry UPHSD Vol. 1, 2016. Presented to APDC 2016 Hongkong

11. A Proposed Anterior Teeth Selection Index for Filipino Complete Denture Patients.
Denstiste Official Publication of the College of Dentistry UPHSD Vol. 1, 2016. Presented to APDC 2016 Hongkong

12. Establishing maxillary incisor height for filipino complete denture patients. Unpublished.
Presented to APDC 2016 Hongkong

13. Development of Mandibular range of motion for Filipino.
Unpublished. Presented to APDC 2016 Hongkong

4. School Experience:

Position	School	Date
Faculty/Chief of Clinics	University of Perpetual Help system Dalta	Present
Chief of Clinics	Manila Central University	2013 to 2014
Faculty	Centro Escolar University	2011 to 2013

5. Non-School Experience:

Position	School	Date
Guest Lecturer	Academy of Orthodontics	2010 up to present
Resident Lecturer	Light Orthodontics	2010 up to present

6. Educational and Professional Seminars Attended (Most Recent)

Name/Nature of Seminar	Inclusive Dates	Place of Seminar Attended
1. Philippine Dental Association (Table Clinic presenter)	**May 2016**	**SMX Pasay City**
2. Asia Pacific Dental Congress (Research Presenter)	**June 2016**	**Hong Kong**
3. UPHSD Internationals Research Congress (Research Presenter)	**Feb. 20116**	**UPHSD Las Pinas Campus**
4. PPTC dental seminar (Lecturer)	Dec 1, 2015	Global city, Taguig
5. 4th Asian Congress for Temporo mandibular Joint (Research Presenter)	Nov. 16 to 18, 2015	Solaire Philippines
6. Neodent orthodontic implant seminar	Sept. 2, 2015	Philippine College of Surgeon
7. Genius Self Ligating braces system	Aug. 25 and 26, 2015	Hotel Intercontinental Makati
8. Basic life support and Advance Cardiac life support	Jun. 8 and 9, 2015	St. Jude Hospital
9. Pierre Fauchard Academy (inductee)	July 12, 2015	Sofitel Manila
10. UPHSD Research Congress 2015 (Presenter)	Feb. 26, 2015	UPHSD Las Pinas Campus
11. HK IDEAS	Aug. 2014	Hongkong

7. Membership in Professional Organizations:

Name of Organization	Position	Date
Philippine Dental Association	Member	Since 2004
Angeles Dental Chapter	Member	2015
OPAP	Member	Since 2011
PAFJO-TMJ	Member	2015
Pierre Fauchard Academy	Fellow	2015

8. Civil Service Eligibility or Other Examination/s Passed

Title	Date
Dental Board Exam	**2004**

9. Community Service (State nature and Organization)

Annual Dental Mission Family International 2012 to 2015
Dental Mission PCU-PHD Society June 2015

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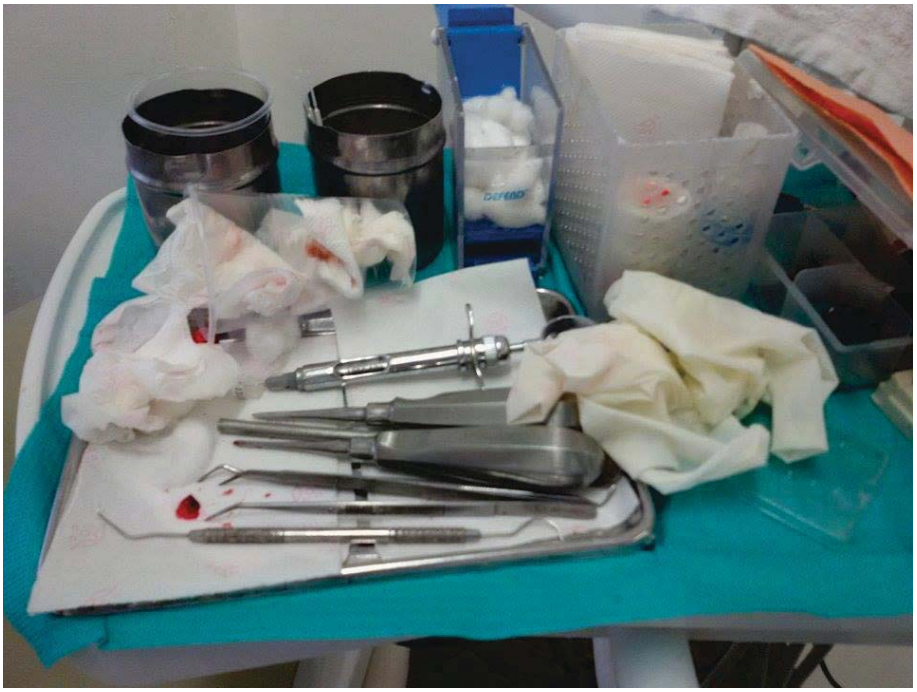
Brian E. Esporlas DMD, MSD, FPFA

APENDIX II

Tooth Extraction Armamentarium and Waste



APENDIX III

Waste Management Hierarchy

APENDIX IV

Collected Oral Specimen

APENDIX V

Dental Materials Waste in a Dental Laboratory

APENDIX VI

PARTICIPATION OF DENTAL PROFESSIONAL TO CITY FIRE DRILL EXERCISE

APENDIX VII

EQUIPMENT INSIDE DENTAL OPERATORY

APENDIX VIII

DENTAL X-RAY UNIT

APPENDIX IX

LETTER TO THE RESPONDENTS

Towards an Enhanced Occupational Health and Safety Model for Dental Professionals

Brian E. Esporlas AA, DMD, MSD, FPFA
Adviser: Maria Belen Pascual Ph.D

Dear Fellow Dental Professionals:

I am Dr. Brian E. Esporlas, student of Philippine Christian University under the Doctor of Philosophy program Major in Development Administration. I am currently writing my dissertation on the compliance and awareness of dental professional on the Philippine Occupational Health and Safety Standard.

May I ask a few minutes of your time to answer some questions?

Thank you very much for your cooperation.

Dr. Brian E. Esporals
Doctor of Philosophy Dev. Ad
Student

MARIA BELEN PASCUAL Ph.D
Adviser

APPENDIX X

THE QUESTIONNAIRE

Name (Optional)_____ School graduated from_____
Year of College Graudation_____ Highest Educational Attainment_____

Please select 1 answer. Circle the letter corresponds to your answer.

1. Age
   a. 18 and below b. 23 to 28 c. 29 to 33 d. 34 to 39 e. 40 to 44 e. 45 to 49 g. 50+
2. Gender
   a. Male b. Female
3. Location of Practice
   a. NCR B. Cebu c. Davao
4. Profession
   a. Dentist b. Dental Hygienist c. Dental Laboratory Technologist
5. How important are the following Occupational Health and Safety standard from the respondent's perspective?

   5 – Very Important 2 – Not important
   4 – Important 1 – Not Sure
   3 – important to some extent

   Please check the appropriate box for your answer.

Constituent	5	4	3	2	1
1. General safety and health					
2. Work place					
3. Exits and Access					
4. Fire Protection					
5. Housekeeping and general work environment					
6. Machine and equipment					
7. Materials					
8. Waste Management					
9. Employee's protection					

6. What is the level of awareness and compliance of the respondents on the Occupational Health and safety standards in terms of **General Safety and Health**? Please check the appropriate boxes for your answers.

5 – extremely aware / compliant
4 – Moderately aware / compliant
3 – somewhat aware / compliant
2 – Slightly aware / compliant
1 – Not at all aware / compliant

5	4	3	2	1	Statement	5	4	3	2	1
Awareness						compliance				
					1. Hospital should be within 5 kilometers from the workplace or is accessible within 25 minutes of travel.					
					2. Transportation can be provided in case of emergency.					
					3. Work place is free from hazards that are likely to cause physical harm to the workers, patients and guests.					
					4. Substituting a non-toxic biodegradable cleaner for a hazardous chemical cleaner.					
					5. Reuse product over and over again for a given function as intended					
					6. select reusable rather than disposable products whenever possible					
					7. set reliable standards for disinfection and sterilization of equipment and materials for use					
					8. Practice Recycling					
					9. Practice Waste Segragation					

7. What is the level of awareness and compliance of the respondents on the Occupational Health and safety standards in terms of **work place, exit and access**? Please check the boxes that will represent your answers.

5 – extremely aware / compliant
4 – Moderately aware / compliant
3 – somewhat aware / compliant
2 – Slightly aware / compliant
1 – Not at all aware / compliant

5	4	3	2	1	Statement	5	4	3	2	1
Awareness						Compliance				
					1 The work place is properly ventilated					
					2 The work place has flat and leveled flooring					
					3 the work place has enough height ceiling distance from the floor					
					4 The work place is provided with clean and well maintained lavatory and toilet.					
					5 The door can facilitate exit and entry of PWD in a wheel chair					
					6 The work place has secured and fastened cabinet that will not fall, tip, or slides during earthquake or during any kinds of accidents					
					7 The work place installed signages of the emegergency exit direction and location					
					8 The work place exits are not blocked.					
					9 The Work place exits can be easily open from the inside.					
					10 The work place has a displayed evacuation plan in all corners.					
5	4	3	2	1		5	4	3	2	1
Awareness					Statement	Compliance				
					11 The work stations has enough distance from each other.					
					12 The work place emergency exits cannot be opened from the outside					
					13 The work place has stocks of survival kits and first aid kits					
Awareness										**compliance**
5	4	3	2	1		5	4	3	2	1
					14 The work place is in far proximity from establishment that emits radiation					
					15 the work place has no exposed plumbing from on the floor					

8. What is the level of awareness and compliance of the respondents on the Occupational Health and safety standards in terms of **Fire and protection protocol**? Please check the boxes that will represent your answers.

5 – extremely aware / compliant
4 – Moderately aware / compliant
3 – somewhat aware / compliant
2 – Slightly aware / compliant
1 – Not at all aware / compliant

5	4	3	2	1	Statement	5	4	3	2	1
Awareness						Compliance				
					1 The work place has a Fire and protection clearance from the Bureau of Fire and Protection.					
					2 The work place has enough power outlet					
					3. the work place has no power extension cord that is lying around					
					4 The work place has its own Fire extinguisher					
					5 The work place has an installed Water sprinkler system					
					6 Work place has an installed smoke and fire alarm					
					7 The work place has fuse/short circuit box that is visible and accessible anytime and is easy to operate					

9. What is the level of awareness and compliance of the respondents on the Occupational Health and safety standards in terms of **General Work Environment and housekeeping**? Please check the boxes that will represent your answers.

5 – extremely aware / compliant
4 – Moderately aware / compliant
3 – somewhat aware / compliant
2 – Slightly aware / compliant
1 – Not at all aware / compliant

5	4	3	2	1	Statement	5	4	3	2	1
Awareness						Compliance				
					1 The work place are always clean and tidy					
					2 the work place has no stagnant water that will serve as mosquitoes nest					
					3 the work place is not infested with any pest or insect					
					4 The work place has no foul odor and is properly ventilated					
					5 The work place does not emit stray radiation					
					6 The work place well Lighted					

					7 the work place has installed emergency lighting system					

10. What is the level of awareness and compliance of the respondents on the Occupational Health and safety standards in terms of **Machine, equipment and materials**? Please check the boxes that will represent your answers.

5 – extremely aware / compliant
4 – Moderately aware / compliant
3 – somewhat aware / compliant
2 – Slightly aware / compliant
1 – Not at all aware / compliant

5	4	3	2	1	Statement	5	4	3	2	1
Awareness						Compliance				
					1 All materials and instruments are well kept in a specific storage areas/cabinet					
					2 All storage areas and cabinet are properly labeled					
					3 All equipment and machines are turned off and unplug when not in use.					
					4 All equipment and machines are periodically calibrated					
					5 All equipment and machines are well maintained					
					6 All personnel are properly trained on how to use the equipment and machines					
					7 Instructions on how to operate the equipments and machines are readily available					
					8 all instruments are sterilized using WHO approved sterilization process					
					9 All equipment are disinfected using WHO approved disinfection process					

11. What is the level of awareness and compliance of the respondents on the Occupational Health and safety standards in terms of **Health care waste management**? Please check the boxes that will represent your answers.

5 – extremely aware / compliant
4 – Moderately aware / compliant
3 – somewhat aware / compliant
2 – Slightly aware / compliant
1 – Not at all aware / compliant

5	4	3	2	1	Statement	5	4	3	2	1
Awareness						Compliance				
					1 Segregate Waste according to its nature					
					2 Waste containers are appropriately labeled.					
					3 Using Waste Containers that is leaked proofed and met specific performance standards					
					4 Follow the Color coding scheme for waste container					
					5 Uses puncture proof, rigid and impermeable waste containers for sharp waste (e.g needle)					
					6 Uses Bags and containers for infectious waste marked with the international infectious substance symbol					
					7 Immediately treating highly infectious and hazardous waste					
					8 Segregate Radioactive waste according to its physical form in especially marked container prescribed by PNRI.					
					9 Provide appropriate containers or bag holder in all location where particular categories of waste may be generated.					
					10 Store all health care waste collected in a waste storage area until transported to a designated off-site treatment facility					
5	4	3	2	1	**Storage**	5	4	3	2	1
Awareness					Statement	Compliance				
					11 Marked the Storage Area with warning sign "caution: Bio hazardous waste storage area- unauthorized persons keep out"					
					12 Store the waste in bags or containers in a separate area					
					13 Dispose waste regularly and frequently or within the prescribe 48 hours.					

Awareness					Collection and transport of health care waste	compliance				
5	4	3	2	1	Statement	5	4	3	2	1
					14 Seek Affiliation with DOH health care waste Collecting/transporting agency					
					15 Replace bags /container immediately with a new ones of the same type					
					16 Keep an ample supply of waste bag/containers					
					17 Provide and keep consignment note of waste for disposal /transport.					

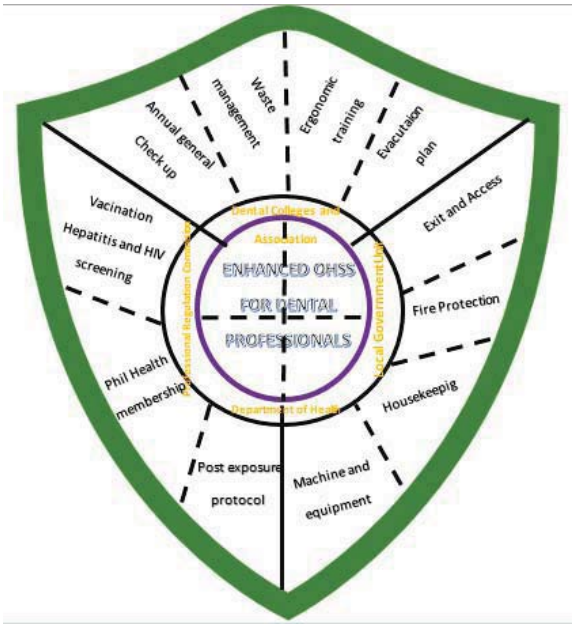
5	4	3	2	1	Statement	5	4	3	2	1
Awareness						Compliance				
					1 Follow the Color coding scheme of waste bags					
					2 Uses international symbol for infectious waste					
					3 store waste on a separate facility					

12. What is the level of awareness and compliance of the respondents on the Occupational Health and safety standards in terms of **employee's protection**? Please check the boxes that will represent your answers.

5 – extremely aware / compliant
4 – Moderately aware / compliant
3 – somewhat aware / compliant
2 – Slightly aware / compliant
1 – Not at all aware / compliant

5	4	3	2	1	Statement	5	4	3	2	1
Awareness						Compliance				
					1. Personnel are all members of Philhealth					
					2. all employees are wearing protective gears during operation					
					3. Management are providing all the necessary protective gears needed by the employees					
					4. Management constantly provide training to the employees about Occupational health and safety practices					
					5 Management constantly reminding employees to wear protective gears					
					6. Preventive Vaccination					
					7. Post Exposure Management to pathogens					

APPENDIX XI



Esporlas' Model for Dental Occupational Health and Safety

The OHSS model as shown in Figure 2 is a shield shaped model symbolizing total protection for dental professional against Occupational health and safety hazard proposed by the researcher. There are 4 governing bodies that can aid for complete and total protection against OHSS hazard for dental professionals: Dental colleges and Association, Professional Regulation Commission, Department of Health and the Local Government Unit.

The Dental Colleges and Dental Association are expected to prepare dental professionals to the dangers posed by occupational and safety hazard. Their main role is to provide high awareness for dental professionals on what is occupational health and safety is all about and what is its important all about. Dental associations are also expected to ensure dental professional to be compliant with occupational health and safety standard in order to

safeguard the general health, not only of the dental professionals but of the whole community as well.

Dental Association must include OHSS training during their annual conference. And only dental professional who completed the annual training on OHSS can be allowed to renew their membership.

Dental Colleges must be working hand in hand with the Commission on Higher Eduction (CHED) and with the national and local dental association. This is to strengthen dental curriculum with the addition of Dental occupational health and safety. Dental Colleges also must protect their enrolees on occupational health hazard as early as admission into the school by simply implementing a preliminary screening and preventive vaccination against some form of communicable diseases such as HIV, Hepatitis and others.

Department of Health always top priority is the general health of every individual. From the community to the healthcare work force. Part of this task is to directly supervise dental professionals on their practices. Particularly those who put up their own clinic or laboratories. A comprehensive permit to operate and a thorough health evaluation and preventive vaccination is a must for the DOH to provide to their health force particularly with the dental professionals.

Only dental professionals who were able to abide with the standard of occupational health and safety should be allowed to register and renew their professional license. And this will be an additional task for the Professional Regulation Commission (PRC). PRC should not limit their service on registration of professional. They must also assist on the safeguarding the general welfare of their members. Renewal of professional license should include requirement such as updated membership to dental association and DOH registration.

The local government unit is responsible for the distribution of permit to operate in terms of compliance to building code, fire code, electrical code and other necessary safety precaution that a professional should follow before a professional can be allowed to operate their clinic and laboratories. However, only dental professional who were able to comply with the requirements of dental association, Department of health, and the professional regulation commission can secure registration from the local government unit.

With this model, awareness of dental professional to occupational health and safety will be increased and at the same time their compliance will be confirmed. At the end, maximum protection against occupational health hazard is guaranteed for dental professionals and the whole community as well.